

Published by
E. HARRISON CAWKER. { Vol. 18, No. 3. }

MILWAUKEE, JANUARY, 1885.

{Terms: \$1.00 a Year in Advance.
Single Copies, 10 Cents.

ABOUT SEVENTY-FIVE FEET

From the engine house of The Geo. T. Smith Middlings Purifier Company, at Jackson, Michigan, the Eldred Milling Company is erecting a 250-barrel flour mill. It will be equipped with Smith Purifiers, Smith Centrifugals, and

→ THE STEVENS NON-CUTTING ROLLS ←

The power will also be supplied by the Smith Co. It is intended to make this a Model Centrifugal All Roller Mill, open to the inspection of the world. Competitors for placing the rolls in this mill appeared from MILWAUKEE, INDIANAPOLIS, GRAND RAPIDS, and many other points, but the award was made solely upon the acknowledged merits of our rolls for their Capacity, Quality of Work Produced, Horizontal and Perpendicular Adjustments, Feeding Device, and general substantial appearance and worth. Success is the true test of merit.

THE JOHN T. NOYE MFG. CO., BUFFALO, N. Y., U. S. A.

SUCCESSFUL FROM THE START

Office of MOUNT HOPE MILLS AND McLEAN STEAM ELEVATOR.

McLean, Ill., Dec. 13th, 1884.

MESSRS. EDW. P. ALLIS & CO., Milwaukee, Wis.

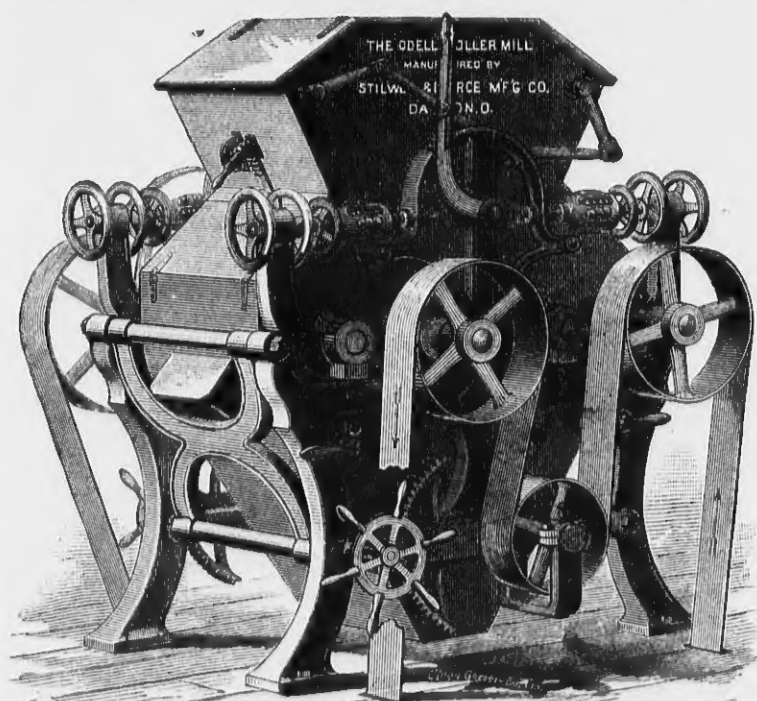
DEAR SIRS:—I cheerfully accept the New Roller Mill that you have built in the place where the old buhrs and other machinery were taken out, and must say that it is fully up to my expectations in every respect, in workmanship and quality of flour produced.

Respectfully Yours,

C. C. ALDRICH.

ODELL'S ROLLER MILL SYSTEM

Is now in successful operation in a large number of mills, both large and small, on hard and soft wheat, and is meeting with Unparalleled Success. All the mills now running on this system are doing very fine and close work, and we are in receipt of the most flattering letters from millers. References and letters of introduction to parties using the Odell Rolls and System, will be furnished on application to all who desire to investigate.



ODELL'S ROLLER MILL,

Invented and Patented by U. H. ODELL, the builder of several of the largest and best Gradual Reduction Flour Mills in the country.

AN ESTABLISHED SUCCESS

WE INVITE PARTICULAR ATTENTION TO THE FOLLOWING

→ POINTS OF SUPERIORITY ←

possessed by the Odell Roller Mill over all competitors, all of which are broadly covered by patents, and cannot be used on any other machine.

1. It is driven entirely with belts, which are so arranged as to be equivalent to giving each of the four rolls a separate driving-belt from the power shaft, thus obtaining a *positive differential motion* which cannot be had with short belts.

2. It is the only Roller Mill in market which *can instantly be stopped without throwing off the driving-belt*, or that has adequate tightener devices for taking up the stretch of the driving-belts.

3. It is the only Roller Mill in which *one movement of a hand-lever spreads the rolls apart and shuts off the feed at the same time*. The reverse movement of this lever brings the rolls back again exactly into working position and *at the same time turns on the feed*.

4. It is the only Roller Mill in which the movable roll-bearings may be adjusted to and from the stationary roll-bearings *without disturbing the tension-spring*.

5. Our Corrugation is a decided advance over all others. It produces a more even granulation, *more middlings of uniform shape and size, and cleans the bran better*.

We use none but the BEST ANSONIA ROLLS.

OUR CORRUGATION DIFFERS FROM ALL OTHERS, AND PRODUCES

LESS BREAK FLOUR and MIDDINGS of BETTER QUALITY.

Mill owners adopting our Roller Mills will have the benefit of Mr. Odell's advice, and long experience in arranging mills. Can furnish machines on Short Notice. For further information, apply in person or by letter to the sole manufacturers.

STILWELL & BIERCE MANUFACTURING CO.,

Agents for Du Four's Bolting Cloth.

[Please mention this paper when you write to us.]

DAYTON, OHIO, U. S. A.

ENDORSED BY THE HIGHEST AUTHORITY.

The Largest Milling Firm in America,

MESSRS. CHAS. A. PILLSBURY & CO.,

Minneapolis, Minn., having decided to rebuild the "Pillsbury B" mill destroyed by fire in December, 1881, has placed the contract for the entire work of furnishing and erecting a strictly first-class roller mill of 1500 to 2000 barrels capacity, with

Edward P. Allis & Co.,

Reliance Works, Milwaukee, Wis. This is the largest mill ever contracted for in one contract in this country, and in placing the contract, the owners were influenced solely by the superiority of the machinery furnished and work done by Edward P. Allis & Co.

It is further worthy of note that after a thorough trial of several years in the "Pillsbury A" and "Anchor" mills, owned by the same firm, in comparison with the Stevens, Downton, and various other roller mills, the celebrated

GRAY'S NOISELESS BELT ROLLER MILLS

Were selected by Messrs. Pillsbury & Co., as being indisputably the best in every particular, and all bidders were required to figure on using these well-known machines. Parties from Buffalo and Indianapolis were not asked to figure on the work.

The mill will be planned and erected under the supervision of the eminent milling engineer, Mr. Wm. D. Gray, and will add another to the long list of notable mills planned and built under his direction.

The United States MILLER

Published by
F. HARRISON CRAWFORD {VOL. 18. NO. 3}

MILWAUKEE, JANUARY, 1885.

Terms: \$1.00 a Year in Advance.
Single Copies 10 Cents.

THE FOOD CROPS OF MEXICO.

The great cereals of Mexico are maize, or Indian corn, wheat, and barley. The extraordinary fecundity of the maize, ranging as high as four hundred to one, in spite of the lax and rude agriculture, makes it the foremost crop in our sister Republic. Its value in 1883 is given at \$114,165,290; that of wheat is stated at \$17,598,890; while barley (grown chiefly on the higher portions of the eastern table-lands of the Sierra Madre) is put at \$4,503,770. Corn is produced in every one of the twenty-nine political divisions of the Mexican Republic, though its largest growth is found in the States of Jalisco, Guanajuato, Mexico, Oajaca, Michoacan, Puebla, Vera Cruz, San Luis Potosi, Zacatecas, Yucatan and Hidalgo, wherein the annual value of the crop, as named, ranges from about \$17,000,000 down to about \$4,000,000. These eleven States are, with the exception of Vera Cruz and Yucatan, mainly included within that favored portion of the southern table-land, which, while designated as the *tierra templada* (temperate earth), yields equally of tropical and temperate products. The annual products of the States of Guerrero, Nuevo Leon, Durango, Sinaloa, Morelos, Tamaulipas, Tlascala, Chihuahua, Queretaro, Sonora, Tabasco, Coahuila, Chiapa, and probably Agnas Calientes, ranges from over \$3,000,000 down a little less than a million. The heaviest growing States are Jalisco, Chihuahua, Guanajuato, Puebla, Zacatecas, and Coahuila, which produced two-thirds of the whole crop.

Wheat grows on the plateau of Mexico at from 6,000 to 9,000 feet above the sea-level, and between the eighteenth and twenty-fourth parallels of latitude. Corn grows everywhere, except on certain waste districts along the frontier, where the soil is the same as the arid plains of Arizona and New Mexico. The wheat-growing area of Mexico, *par excellence*, extends from, say, Puebla nearly to Colima, about 500 miles east and west, and from Southern Michoacan to Southern and Central Chihuahua, about 500 miles north and south. This plateau is broken by mountain ranges into a number of rich districts specially adapted to the growing of wheat, and of this immense field of rich and arable land one-third, it is believed, could be readily put into wheat with due regard to all other agricultural interests. Under the Mexican plan of cultivation three crops are taken off the land every two years, one crop of wheat and two crops of corn. The average yield of wheat of Mexico does not now exceed 20 bushels to the acre. Corn on irrigated lands runs about 50; on dry land about 30 bushels to the acre. The mode of cultivation is similar to that of the Egyptians thousands of years ago. Wooden-beam plows are used, with small iron shoe, which scratches a furrow five inches broad by five deep. Five men are used and five yoke of oxen where one would be needed in Pennsylvania. Nevertheless, the grain is of the very finest quality, and at the Centennial Exhibition Mexico took the first prize, leading the world in wheat, as in coffee. Threshing is done as in the olden way, on a hard floor, in the open air and by driving mares over the wheat. The grain is winnowed by men tossing it into the air with large scoop-shovels, thus imperfectly separating the chaff. The grain is then taken from the threshing floor to the granaries or railway depot, in ponderous and rudely constructed two-wheeled carts, creaking at every turn. There is more cart than grain in the load pulled by the patient oxen. Already, however, there are marked changes in this primitive method, with its quaint aspects, so suggestive of oriental life and biblical descriptions. American implements and machinery are going in rapidly, and the only danger is that the large land-owners may push the changes required too rapidly for the immediate welfare of the laborers of the country.

Rice is also an indigenous product of Mexico. But little attention has been given to

its cultivation until within a year or two past. Some part of the crop is exported, and meets approval. There are large areas in the lower States where the cultivation of rice could be made profitable.

Potatoes are indigenous to Mexico, and are still found growing wild as far north as the table-land or mesas of Southern Arizona. As to barley, it is a grain of the higher region, and grows well at a surprising altitude. The plow in common use in Mexico consists of two poles, one 6 feet long and the other 15 feet, fastened together by a mortise and tenon at an angle of 65°. Through and near the end of a short pole there is a pin to steady the plow, and on its end there is attached a pointed iron or steel shoe to prevent it from readily wearing out. The yoke has no bows, but is fastened on the heads of the cattle by means of raw-hide thongs, and so is the tongue of the plow to the yoke. With this rude implement the fecund soil is scratched to the depth of three inches. The modern and light farming tools used in this country were until very recently almost wholly unknown in Mexico. The machete (sugar-cane knife), clumsy hoes and spades, with a heavy sickle and pruning or cutting knife, constitute most of the farm tools used by the rustic "labores." Burdens are yet borne on the backs of men or women, as a rule; the barrow is a convenience still uncommon off the lines of railroad, and not common even there. The irrigation is largely regulated by manual labor. With the Mexican farmer plowing for wheat begins in August and lasts until he wants to stop. Wheat is sown broadcast from October 1 to January 15, and is harvested the following June. After the wheat is up it looks as if it had been sown with a drill, owing to its having fallen into the furrow made by the plow. From one-third to one-half the wheat is lost by the primitive methods used in threshing. The price of wheat (1883) per fanega (150 pounds) in our money was from \$2.75 to \$3. The first crop is prepared for in February and March; it is laid by in August, and gathered in December. The second crop is planted in June and July, laid by in August and September, and gathered in December and January. The reason why the second crop matures more rapidly than the preceding one is because no irrigation is needed, the rainy season making it grow with great rapidity.

Tortillas, the common food of the country, are made by placing a quantity of maize in a jar of hot water and lime over night. Great care is taken as to the quantity of lime to be used, as otherwise the grain will not be properly softened. In the morning, or when it is to be used, the grain is taken out of the jar and placed upon a small stone bench, at which a woman kneels, and then, with a long stone roller, reduces the grain to a kind of paste. When it has obtained the proper consistency it is patted with the hand until it assumes the form of small pancakes, which are then slightly dried or baked on a large earthen tray or pan, over a small charcoal fire. The tortilla is made! Everybody eats them. Foreigners, especially Americans, find them detestable. Their preparation is a waste of labor and material both. It is fearful drudgery to the women; and whether so considered or not in Mexico, is to all others who take note of things there as they are, the outward and visible sign of the industrial and social degradation of the mass of women. The preparation of the tortilla takes up so much of their time that no proper care is taken of the dwelling, the children, or of themselves. Some Yankee inventor, who has seen the tortilla-making process, might readily devise a small and cheap machine by which the maize-paste, so much delighted in by the Mexicans, could be furnished to whole neighborhoods. It is hardly possible to change their habits and induce the use of ordinary corn-meal all at once or even extensively, yet it might be done in the cities and be made a profitable venture for some enterprising person.

AN ALL-ROLLER AND CENTRIFUGAL MILL.

We clip the following description of the Eldred Mill, of Jackson, Mich., from the columns of the *Roller Mill*. It will be furnished completely by the Jno. T. Noye Co., of Jackson, Mich., including the Stevens' rolls. The well-known qualities of this firm for efficient and durable work, is sufficient guarantee that the mill will be complete. "The building is of brick with stone foundations, 45 by 60 feet, four stories high with basement. The average height of each story is fourteen feet from floor to floor. This gives an unusually ample amount of room, even for so complete a line of machinery as will be included in this mill. Connected with the mill is an elevator 25x45 feet and running the full height of the mill. This will give a storage capacity of 30,000 bushels of wheat. Part of the elevator will be used for flour and feed storage.

"The grain will be cleaned on a full line of the most efficient machinery, passing from them to the break rolls. Seven breaks will be made on 9x18 and 9x24 rolls. In all there will be twelve double sets of rolls, smooth, scratch and corrugated, in the mill, and on these will be performed the entire work of reduction. Twelve scalpers, 8x30 inches, will receive the product from the different breaks, and chop from the first five breaks will also be treated on a special break or aspirating purifier.

"In addition to these break purifiers, there will be ten regular purifiers, making in all fifteen of these machines.

"The bolting will all be done by centrifugals, of which there are to be twelve in the mill. Before reaching the centrifugals, however, the material will have to pass through special grading reels of novel construction, of which there are also twelve.

"Another novel feature in this mill will be the entire absence of bran dusters. In their stead will be used two wire-clothed centrifugals, one on bran and one on feed.

"As will be at once noticed, the equipment of this mill is decidedly more elaborate than is usually the case with mills of this capacity, but as it is intended to be in some sense an 'experimental' as well as a 'model' mill, and as the financial resources of its builders are ample, no expense will be spared to bring it as near the ideal as possible. Every minor detail will be given the most careful attention, and the result will be a mill that will be a credit to all concerned in building it, and an object of admiration to the trade at large."

A GERMAN VERTICAL FLOUR DRESSING MACHINE.

A recent number of *The Millers' Gazette* (London) says: Mr. Wilhelm Bernhardt, of Stettin, Germany, has constructed a new vertical flour-dressing machine, in which the meal is passed on to a horizontal feed plate, which is fixed to the vertical beater shaft on the top of the machine. The feed plate, therefore rotates with the beaters, and the meal is thrown by centrifugal force against the vertical inner silk cylinder, which serves as a preparatory dresser. It is clothed either with coarse silk or a fine wire gauze, and is fixed around the beater drum at about $\frac{1}{2}$ inch distance.

The beater drum consists of six beaters, which are connected with each other by means of horizontally inclined ring segments so as to form continuous spirals. The outer edges of the ring segments come within $\frac{1}{2}$ inch of the cylinder, whereas the vertical beaters are at least 2 inches from the silk. The ring segments are $\frac{1}{2}$ inch wide, and they cause the meal to descend but very slowly in the dressing cylinder, and as the meal is thrown against the silk in an undulatory manner the silk meshes are not likely to clog. The fine particles pass through the inner dressing cylinder, and only the coarse bran descends and is caught in a separate hopper.

At a distance of about $\frac{1}{2}$ inch from the inner dressing cylinder is fixed an outer dressing cylinder of fine silk, and the air current which is created by the beater drum is strong enough to drive the fine flour through the same,

whereas the fine bran particles and the middlings will fall down between the two cylinders and be collected in a separate hopper. The flour is also collected in a separate hopper.

A NOTED CORN MEAL MILL.

Mr. Cyrus W. Field, the widely known New York millionaire, the man who laid the first cable across the Atlantic, and Mr. A. G. Mowbray, the progressive and well known Minnesota miller, until lately superintendent for the Winona Mill Co., Winona, Minn., have begun the construction of what is to be the largest and finest corn, grits and corn-meal mill in the country. Nothing short of the best mill with the best results would be appropriate to Mr. M., who is well known to be an expert miller. These gentlemen have placed the entire contract for the machinery in the hands of the Case Manufacturing Co., of Columbus, Ohio. The reductions have to be gradual and are to be made on "Bismarck" rolls and a general system of scalping, purifying and separations is to followed, much the same as in wheat milling, the reductions and separations, of course, to be adapted to corn. There is now quite a demand for purified corn meal. There is said to be more difference between general reduction corn meal and the old product than between the roller and burr wheat flour. Scalping and purifying between reductions seems to be quite as important as in wheat milling. The trade will watch this particular enterprise closely, and it is expected that much will be developed by it. Their mill will be located a few miles outside of New York City. The work will be superintended by Mr. E. Corbett, of Sandusky, Ohio, who is a "master builder," and has been identified with the Case Co. for many years.

AN INVENTION NEEDED.

The inventor who will devise a cheap, speedy-working power-press, which will press straw or hay into small solid blocks to furnish fuel for our vast, woodless tracks of wheat country, would surely enrich himself. Such a press, if practical, cheap and durable, would confer a great blessing upon the country. Millions of tons of straw and hay are now burned to waste, which by such a device might be converted into valuable fuel. Our present straw-burning engines, although valuable, do not fully fill the bill.

MILLING PATENTS.

The following list of patents relating to the milling interests, granted during the past month, is specially reported by Franklin H. Hough, Solicitor of American and Foreign Patents, 617 Seventh street, N. W., Washington, D. C.

Issue of Nov. 25, 1884.—No. 308,496—Grain-elevators, Revolving Chute for; J. Hughes, Minneapolis, Minn. No. 308,557—Grinding-mill Roller; W. R. Fox, Grand Rapids, Mich. No. 308,404—Millstone-driver; J. P. Callahan, Knoxville, Tenn. No. 308,568—Roller-mill; T. W. B. Mumford and R. Moodie, Victoria Docks, England. No. 308,375—Wind-mill; G. H. Pattison, Freeport, Ill.

Issue of Dec. 2, 1884.—No. 308,613—Bolting-reel, Centrifugal; S. Hughes, Hamilton, Ohio. No. 308,844—Flour-bolt, Centrifugal; J. Kuhnmann, Buffalo, N. Y. No. 308,650—Grain-separator; R. Brand, Oakland, Cal. No. 308,651—Grain-separator; R. Brand, Oakland, Cal. No. 308,631—Grinding-mill; A. F. Schult, La Crosse, Wis. No. 308,692—Separating-mill; J. Osford, Worthington, Minn.

Issue of Dec. 9, 1884.—No. 308,613—Bolting-reel; D. Schindler, Zurich, Switzerland. No. 309,176—Bolting-reel; J. Warrington, Indianapolis, Ind. No. 308,894—Grain-scouring Machine; J. B. Harris, Ottawa, Ill. No. 308,796—Grinding-mill; J. B. Obenchain, Logansport, Ind. No. 309,078—Mills, Dust-collector for; C. O. Mook, Jackson, Mich. No. 308,978—Reduction-mill, Gradual; T. J. Obenchain, Logansport, Ind. No. 309,100—Rolling-mill; E. Samuel, Philadelphia, Pa. No. 309,077—Wind-mill; J. R. Millard, Los Angeles, Cal.

Issue of Dec. 16, 1884.—No. 309,496—Bolting-cloth, Device for Tightening; G. T. Smith, Jackson, Mich. No. 309,497—Bolting-cloth, Device for Stretching; C. A. Smith, Jackson, Mich. No. 309,394—Grain-dryer; H. L. P. F. & H. G. Chase, Chicago, Ill. No. 309,394—Grain Separator; J. B. Martin, Silver Creek, N. Y. No. 309,190—Grinding-mill; J. T. Case, Bristol, Conn. No. 309,303—Grinding-mill; O. Hoffman, St. Louis, Mo. No. 309,306—Grinding-mill; W. C. Westway, Delavan, Wis.

UNITED STATES MILLER.

PUBLISHED MONTHLY.

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MILWAUKEE, JANUARY, 1885.

ANNOUNCEMENT.

WM. DUNHAM, Editor of "The Miller," 69 Mark Lane, and HENRY F. GILLIG & Co., 449 Strand, London, England, are authorized to receive subscriptions for the UNITED STATES MILLER.

We send out monthly a large number of sample copies of the UNITED STATES MILLER to millers who are not subscribers. We wish them to consider the receipt of a sample copy as a cordial invitation to them to become regular subscribers. Send us One Dollar in money or stamps, and we will send THE UNITED STATES MILLER to you for one year.

The United States Consuls in various parts of the world who receive this paper, will please oblige the publishers and manufacturers advertising therein, by placing it in their offices, where it can be seen by those parties seeking such information as it may contain. We shall be highly gratified to receive communications for publication from Consuls or Consular Agents everywhere, and we believe that such letters will be read with interest, and will be highly appreciated.

TO ADVERTISERS.

Milwaukee Wis., October, 1884.

To Those Interested in the Flouring Trade:

THE UNITED STATES MILLER is now in its ninth year, and is a thoroughly established and much valued trade paper. It has a large regular list of domestic and foreign subscribers. It is sent monthly to United States Consuls in foreign countries, to be filed in their offices for inspection by visitors. It is on file with the Secretaries of American and European Boards of Trade for inspection of members. Aside from the above, thousands of SAMPLE COPIES are sent out every month to flour mill owners who are not subscribers, for the purpose of inducing them to become regular subscribers, and for the benefit of those advertising in our Columns. Every copy is mailed in a separate wrapper. Our editions have not been at any time since January, 1882, less than 5,000 COPIES each, and are frequently in excess of that (see affidavit below). We honestly believe that the advertising columns of the UNITED STATES MILLER will bring you greater returns in proportion to the amount of money invested than any other milling paper published. Advertisers that have tried our paper for even a few months have invariably expressed themselves well satisfied with the results. Our advertising rates are reasonable. Send for estimates, stating space needed. The subscription price of the paper with premium is One Dollar per year. Sample copy sent free when requested. We respectfully invite you to favor us with your patronage. We shall be pleased to receive copies of your Catalogues, and also trades items for publication free of charge. Trusting that we may soon be favored with your orders, we are,

Yours truly,

UNITED STATES MILLER.

E. HARRISON CAWKER, Publisher.

"MILL FOR SALE" ads. inserted once for \$2.00, or three times for \$5.00, cash with order.

"SITUATION WANTED" ads. 50 cents each insertion, cash with order.

Publisher's Affidavit Concerning Circulation.

STATE OF WISCONSIN, ss.
MILWAUKEE COUNTY, ss.

E. HARRISON CAWKER, editor and publisher of the United States Miller, a paper published in the interest of the FLOURING INDUSTRY at No. 124 Grand Avenue, in the City of Milwaukee and State of Wisconsin, being duly sworn, deposes and says that the circulation of said paper has at no time since January, 1882, been less than FIVE THOUSAND (5,000) copies per month; further, that it is his intention that it shall not in the future be less than FIVE THOUSAND copies each and every month; further, that he has paid for regular newspaper postage at the rate of two (2) cents per pound on domestic and Canadian newspaper mail for the last eight (8) months, including May, 1884, the sum of \$160.00, showing that in that time 8,045 pounds of United States Millers have been mailed; further, that the foregoing postage paid does not include postage paid on city and foreign papers (Canada excepted). [Signed]

E. HARRISON CAWKER,
Publisher United States Miller.

Subscribed and sworn to before me, this 30th day of June, 1884.

B. K. MILLER, Jr., Notary Public,
Milwaukee County, Wis.

Amount of postage paid for June, \$18.26; July \$17.62; August, \$17.58; September, \$17.68. Affidavits will be sent to advertisers from time to time. The original post office receipts can be seen at any time in this office.

MILWAUKEE AMUSEMENTS.

GRAND OPERA HOUSE.—Performances every evening, and Wednesday, Saturday and Sunday matinees.

ACADEMY OF MUSIC.—Performances every evening, Wednesday, Saturday and Sunday matinees.

BLESBY'S VARIETY THEATRE.—Performances every evening, and Thursday and Sunday matinees.

DIME MUSEUM.—Performances every hour from 1 P. M. to 10 P. M., every day. Freaks, curiosities and excellent stage performances.

We have received a very handsome catalogue from H. W. Caldwell, of Chicago, Ill.

MINNEAPOLIS flour mills turned out a little over five million barrels of flour during the year 1884.

We cordially wish our readers

A Happy New Year!

THE Wisconsin Press Association will visit the New Orleans Exposition in February. About two weeks will be taken for the trip.

ALL the flour mills in St. Louis, when running to full capacity, can together turn out about 19,000 barrels of flour per day.

H. C. RAU, Esq., of the Bradford Mill Co., Cincinnati, O., called on us Dec. 31. Mr. Rau is an old Milwaukeean and takes pleasure in making annual visits to our fair city.

THE last rail has been laid on the Wisconsin Central Railroad to complete the connection of Milwaukee with St. Paul and Minneapolis, and the road will be open for through business on Jan. 12, 1885.

E. CLAKKE, Esq., of the Australian Flouring Mills, Spencer street, Melbourne, Australia, would like to be favored with copies of catalogues and price-lists from American mill-furnishers.

THE milling trade will be quite well represented at the New Orleans Exposition, as regards machinery and products. One of the most interesting exhibits will be the fully equipped model roller mill constructed by Edw. P. Allis & Co., of Milwaukee.

MESSRS. EDW. P. ALLIS & Co., of this city, are to be congratulated upon receiving the contract for fitting up the Pillsbury B. mill at Minneapolis. The mill is to have a capacity of from 1,500 to 2,000 barrels per day of 24 hours, and Gray's roller mills will be used. We believe this is the largest milling contract made during the year of 1884.

We were favored with a call during December by Geo. T. Smith, Esq., president of the G. T. Smith Middlings Purifier Co., of Jackson, Mich., and Mr. Clark, of the same company. The gentlemen struck Milwaukee during a bitter cold spell of weather, but, we think, managed to enjoy the visit right well, anyway. Come again, gentlemen, when the thermometer stands above the freezing point.

BRADSTREET'S gives the number of failures in the United States during the year 1884 at 11,600, with liabilities of \$240,000,000, and assets \$130,000,000. The number of failures in 1884 exceeds by about 1,000 those in 1878, during which the greatest commercial depression was experienced prior to the revival of trade in 1879. May we not believe that the worst is past, and 1885 will witness another great revival in all lines of trade?

MR. CHARLES TOUAILLON, of Paris, France, died Dec. 1, aged 73 years. He was one of the best known French milling engineers. He was the author of many works and essays on milling engineering and the inventor of several machines used in flour mills. He was a firm believer in the utility of millstones for reducing grain, and was bitterly opposed to the introduction of any system of rollers for milling in France.

A GLANCE at the column headed "Business Items," in another portion of this paper, makes plain the unwelcome fact that small millers throughout the country are fast succumbing to the reigning depression. The tendency of the times is toward centralization of the milling business, and, if continued, will result ultimately in the financial ruin of a large number of small country millers.—St. Louis Miller.

J. V. W. of Athlone, Ont., propounds the following to the UNITED STATES MILLER: "I think of building a barrel-flume out of scantling three inches thick. Have a head of 23 feet and a 'Little Giant' water-wheel 14 inches in diameter. The gate in the throat of the wheel is 6 by 8 inches, and the capacity of the mill is about 50 bushels in 10 hours. The flume is to be 450 feet long and under ground. Now, I desire to know what size the tube ought to be to convey sufficient water, and to what part of the penstock will it be best to connect the flume, and if a short drop at the head of the flume would be of any particular benefit to it?" Answer. Tube should be 30 inches inside. Put upper end of flume 2 to 3 feet below the surface of head-water. The tube should enter the penstock as near as convenient, and to avoid angles in current as much as possible.

THE insurance question is one that will never cease to be a most important one with millers. The stock companies keep up their rates as high as they dare to and expect to obtain business. The millers' mutual companies are all doing well, we believe, but they

are not yet numerous enough, or strong enough, financially, to carry all milling fire risks. This being the case, mill-owners will have to make the best terms that they can with reliable companies.

THERE are no hod carriers in Germany. Bricks are passed from hand to hand. The higher up the bricklayers are the more men are required to toss the bricks. Two men to a story is about the average, with enough more to lead from the front of the building to the place where the bricks are needed. One may sometimes see three men on the ground, eight on the front of the building, and five on the top, making sixteen men through whose hands each brick passed before it reached its place of destination.

THE conclusion to be drawn from the fact that all of the great mills of the country are running nearly up to full capacity, is that they are making money. Millers do not like to work for nothing, any better than any other class of manufacturers, neither do they keep their mills going simply to give employment to operatives. The margins are, no doubt, in all cases, very small, in comparison to what they have been in the past, but it is evident that large mills, properly equipped for the very economical manufacture of flour, are making money. Medium sized and small mills are not doing so well, and old-fashioned mills, with few exceptions, have "dropped out of sight."

A COMMERCIAL traveler for a house manufacturing grain cleaning machinery recently told us that less attention was paid to the running of the cleaning machinery than to any other class of machinery in the mill. Hundreds of millers would scarcely ever pay any attention to the cleaning machinery from one month to another, unless they were compelled to by a clog up or breakage. It speaks well, he said, for the machinery to be able to turn out work at all satisfactory with so little attention. It should never for a moment be forgotten that wheat should be thoroughly cleaned before it is ground. This advice has been given so long and so often that old millers don't like to hear it. Well, don't, then; but let the young miller heed it. Pay strict attention to your cleaning machinery and see that your wheat is perfectly cleaned before grinding.

THE holiday number of the Northwestern Miller, with a handsomely lithographed cover, illustrated with many "quaint and curious pictures of forgotten lore," and brim full of good things appropriate to the occasion, has come to hand. It shows the happy result of many months of hard labor, and we trust that the publisher will be rewarded not only by the warm appreciation of the trade, but by ample financial returns. That Minneapolis millers and mill-furnishers took a hearty interest in the success of the number is evident by reference to its pages, and Mr. Palmer may well feel proud of such substantial home endorsement. We congratulate him on the fine appearance of this, his second annual holiday number, and hope he may find it both pleasurable and profitable to continue these handsome numbers as the years pass on.

ANTON KUFKE & Co., flour merchants, Liverpool, Eng., under date of Dec. 11, make the following report

Markets have been quieter during the past week, and at Tuesday's market a decline of 1d. per cental was quoted. The weakness is caused mainly by the fall in New York. The trade in flour has been very satisfactory and a large business has been done. Any change in values is in an upward direction, but it must be remembered that during the recent rise in wheat there was no corresponding rise in flour.

Hungarian flours are harder to buy and 6d. more is asked; buyers, however, strenuously resist the advance. Minnesota millers refuse to sell for shipment, except at 1s. per barrel advance, which is unobtainable here; this class is scarce on the spot. St. Louis and winter wheat flours are sparingly offered from America, but are plentiful on spot. Choice and family grades are 6d. higher. Californian flours have sold well at late quotations, and this class is very scarce. Oregon and Walla Walla flours are still offered at the late low prices. The quality of these flours has been most satisfactory throughout the season.

The arrivals for the week ending the 6th, amount to only 286,742 qrs. of wheat and flour, which shows another reduction in stocks. The total imports into the United Kingdom since Sept. 1, amount now to 4,527,864 qrs.

FIGHT YOUR OWN BATTLE.

The question of wages for the laboring man and the advantages he may derive from a trade union, was uppermost in our mind one day last week as we were passing a large work-shop in this city just as the employees

quit work for the day. "Hello, boys, how many hours do you work per day, and what do you get for a day's work?" was our salutation, which was followed by a hearty handshake, such as a mechanic only can give. In a few moments there were two or three dozen greasy, dirty, but intelligent workmen around us, all willing to chat a few minutes. The question of wages came up, and everyone seemed perfectly satisfied. Their wages and hours of work are regulated by the union. We talked with one man who said he had worked at his trade twenty-seven years. "Then you are a boss mechanic?" we said. "No, I am a blacksmith's assistant," he said. "Well, you must have had a poor boss if you have worked faithfully for twenty-seven years and have never risen higher than a laborer," we said. He was a quiet man, an intelligent looking fellow, and in answer he said: "I have had the same boss for thirteen years, but I never set in to learn the trade; I have just worked for wages!" He was getting \$1.35 per day and paying monthly dues to a laborers' union "to protect the laborer in his wages." We learned afterward that the man on the other side of the anvil had only been working at the trade six years, and was getting \$4.00 per day. He set out to learn the trade, and he don't need anybody to protect him in his wages. He can get a job anywhere.—Southern Lumberman.

MINNESOTA farmers are dissatisfied with the grading of wheat at the various elevators in that State, and now have a bill before the State Legislature to regulate wheat grading. Hon. C. A. Pillsbury of Minneapolis, does not think that legislation of any kind will materially benefit either the farmers or elevator men. During the last session of the Minnesota Legislature Mr. Pillsbury worked for the passage of the bill now before it. In a recent interview on the subject Mr. Pillsbury said:

The truth is simply this: The elevator companies are sick and tired of the present system, or rather want of system in the grading of wheat throughout this section, and I was then, as I am now, in favor of any law or suggestion which would relieve the buyer, not only from the annoyance, but from the suspicion which seemed to be attached to all transactions. My private opinion is that no bill which can possibly pass the Legislature will improve the present condition of the farmer. The fact is they have matters pretty well in their own hands now. Most of our elevators come out short in weight as well as in grades; and most of those who have been doing business in the Northwest came out far behind on grading on last year's crops, while many private elevator people were absolutely ruined. Only one of the seven or eight private elevators, paid a dividend. One trouble is that wheat is graded too high here. Some of the wheat they grade as No. 1 hard will be received, and in Chicago it is No. 2 regular. The farther west you go the higher the grade is. Wheat that grades as No. 1 in Duluth would not grade at that in Minneapolis, and a large portion of wheat that grades No. 1 in Minneapolis will grade No. 2 in Chicago. The real evil farmers suffer under is over-grading, not under-grading. Men who raise No. 1 hard wheat are the real sufferers. The highest price paid for any certain quality of wheat, will, by the law of nature, adjust itself to the value of the present quality that may be admitted to that grade. In other words, the real quality of the grain furnished averages itself. Take No. 1 regular or call it No. 1 hard, make a rule to grade it at No. 1 hard, and the man who has got the No. 1 regular is getting no more or less for his wheat than if it was regular; but the man who has got No. 1 hard suffers in consequence of this, because the market price of No. 1 hard is not as high as it would be if the grade were strictly maintained everywhere. I shall, as a member of the Legislature, strongly advocate State inspection, not because I think it will do the farmers any good, but because I think the farmers want it.

GERMAN MILL STATISTICS.

According to statistical returns lately published by the Imperial German Statistical Office 331,179 persons are dependent on the milling industry. Of these 45,255 persons are proprietors, directors, etc.; 2,451 managers, superintendents, and clerks, 70,385 operatives and laborers, or a total of 118,091 persons directly employed in milling. There are besides 20,022 persons employed as domestic servants, and 193,066 persons who form the families of the above milling industrialists, making a grand total of 331,179.

Among the 1,000 industrialists, 6.33 are employed in milling, and among 1,000 of the general population 7.32 are operatives, servants, and family members of milling industrialists.

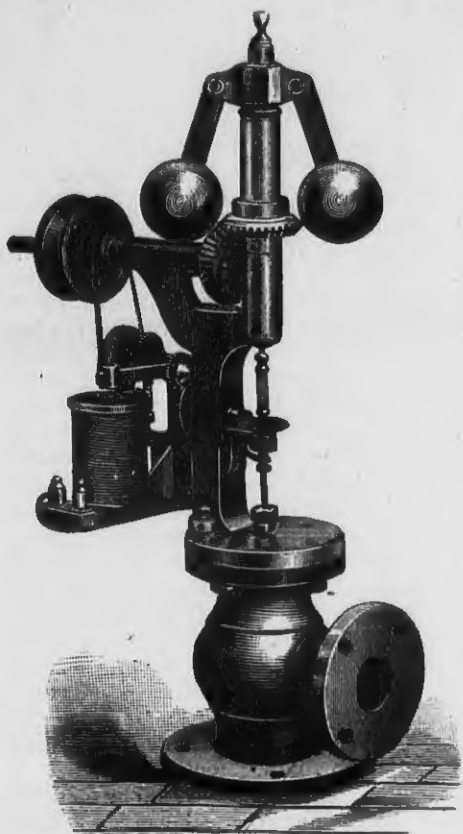
The age of milling industrialists is shown in the following table:

AGE.	PROPRIETORS, DIRECTORS, &C.		MANAGERS, CLERKS, &C.		OPERATIVES AND LABORERS	
	Male.	Female.	Male.	Female.	Male.	Female.
Under 15	15	18	6	1	1378	28
15-20	81	18	143	1	16404	169
20-30	4797	134	899	8	27052	310
30-40	12851	287	694	9	13008	121
40-50	12887	677	365	6	7148	107
50-60	8129	708	156	2	2981	57
60-70	3765	380	59	2	1233	33
70 and above	687	90	11	..	391	10

Jacob Avery was mangled to death in his grist-mill, at Greenbush, Wis., on the evening of the 23d inst. He had come in contact with a set screw on the main shaft of the machinery, and had been whirled until his clothing parted, his body striking the floor at every revolution.

THE AMET ELECTRIC GOVERNORS.

The object of the electric governors, here-with illustrated is to regulate the speed of the engine and dynamo by the strength of the electric current required to supply the number of lamps in the circuit; that is, the greater the number of lamps in the circuit, the greater will be the speed required of the engine and dynamo to furnish the electricity. This is accomplished by a small train of gears driven by a small round belt from the shaft of the governor pulley, and two driving friction wheels moving in opposite directions, which, by means



ELECTRIC STEAM GOVERNOR.

of an electric magnet, included in the electric light circuit are brought into frictional contact with a larger friction wheel, connected by bevel gears and a screw with the valve stem of the governor, thus varying its length according to the speed required of the dynamo for the number of lamps in circuit.

A test of the Amet Electric Steam Governor was recently made at Carnegie's Rolling Mills, Thirty-third street, this city, at which the



WATER-WHEEL GOVERNOR.

governor, though working under exceptionally difficult circumstances, did all that the inventor claims for it.

The steam driving the Westinghouse engine, furnishing the power for the electric lights in the above test, was taken from a large pipe which was supplying one of the large engines running a train of rolls in the mill, and whenever the latter engine required an increased amount of steam the pressure was considerably reduced on the Westinghouse, thus giving the new governor a much larger range of duty to perform than is ordinarily required of any governor.

In the test, at first four lights were cut out of the circuit, thus decreasing its resistance and increasing the strength of the current, which by means of the magnet on the governor, brought into play one of the friction wheels and lengthened the valve stem on the governor, reducing the speed of the engine and dynamo to that required to furnish the number of lights in the circuit. Next, thirteen more lights were cut out of the circuit, to which the governor as promptly responded, and when all the lights are thrown out of circuit the engine is just kept in motion, but ready to furnish power when required.

This principle is also applied to a governor for electric light circuits driven by a water wheel, where it is equally efficient.

These governors are made by the Globe Electric Engineering Company, 35 to 41 Indiana street, Chicago, Ill., from whose circular we make the following extract:

"These governors are designed to afford protection to the dynamo from such causes as lamps cutting or going out accidentally, short circuiting by grounds or other means, or from

any cause that would tend to decrease the resistance to such an extent as to be harmful to the dynamo. It is especially designed for large circuits of lamps, but will control from one up to one hundred or more if they are all in the same circuit. Where a system of electric lighting is extended over a large area, as in the case of the towns or cities from one central station, and it is desirable from economical or other motives, to limit the consumption of carbons and power by placing the lamps under the immediate control of consumers, to be cut in or out of them at pleasure, this governor is invaluable. The parts are few, simple and durable, and require but the attention of an ordinary steam governor.—*American Manufacturer, Pittsburgh.*

WASTE IN THE WORKSHOP.

One of the most common amongst the many sources of everyday expense incidental to the carrying on of an industrial business, and one most generally neglected by those whose duty it should be to prevent it, says the *Mechanical World*, of London, is that of waste in the workshop and amongst the employees. Although the amount in each particular case may be, and probably is, of small proportions, and is consequently considered of little or no consequence, yet in the aggregate it really becomes an expensive item, which tells heavily upon the debit side of the ledger when accounts are balanced up.

In some shops the quantity of small articles, such as screws, nails, panel pins, washers, etc., that may be seen lying upon the floor, kicked about by every passer by, is astonishing. There seems to be no idea of their value, either by the workmen or foreman. If a man drops such a slight article he will not take the trouble to pick it up, and the result is that all around the ground is littered with them, they soon become covered with shavings, sawdust and rubbish, and when the sweeper comes at stated times to clear up he as likely as not shovels half of them into his barrow, wheels them away to the fire, where the rubbish is burned, or throws them in with the ashes and other refuse of the ballast heap. Even if he carries a box, as he often does, into which he may throw say one half of what is dropped, they become of very little use, from the fact that nails and screws of all kinds and sizes become mixed and jumbled up together unless properly sorted into their various kinds, and this is just what is left undone in the majority of cases. We do not imagine that it would be feasible for a man to stoop down every time he drops one of the small articles in question, but he at least might be made to take that trouble occasionally, and put them back in their proper receptacle in his nail-box. As it is, whatever is once dropped may be considered lost. This looseness, too, leads to another and greater evil, and that is speculation and petty theft. It is not to be wondered at that a man, seeing these things treated as if of no value, says to himself as he picks them up and puts them in his pocket: "These nails will come in useful to make that fence or fowl-house in my garden," or "These screws will just do for the box I am going to make for my wife at home." In fact the men look upon it as a kind of perquisite to supply themselves. We even know of one instance in which a coach maker was accused of stealing certain pieces of brass known as "lap plate," which he had sold to a marine store dealer, successfully pleading that it was a perquisite to keep the ends of these plates, as it had been customary for the workmen to do so. Even such comparatively large articles as bolts, nuts and rivets are often seen strewn about the ground, especially out of doors, where they get trodden into the earth. The amount of old iron, etc., that is shot out at the heaps or tips of rubbish would well pay the employer to keep a man to look them over. As it is, women and boys may often be seen outside the works raking over these heaps and making quite a good thing out of the cinders and old metal which they collect. The same waste often takes place at the saw-mills where good-sized pieces of expensive wood, such as teak, mahogany, etc., too small to be utilized on the premises are cut up for firewood instead of being sold to makers of small articles, fancy goods or others. Again, the brass dust and filings made by the fitters are collected in trays fixed to the vises in some establishments, but are swept up with the dirt and wasted in others. Another instance may be mentioned in that of oil, which is often allowed to drip and fall from the shafting pedestals upon the floor, making everything about them greasy and dirty, but which if caught in tin dishes suspended beneath may be used again for the same or other purposes. In the case of gas, too, extravagance requires checking in some factories where it is allowed to flare away at full pressure all over the place without any control, the supplies being of the largest size and most extravagant pattern. If a man leaves his work for an hour or two he does not think to turn down his gas, but al-

lows it to burn all the time. In another better regulated shop, however, the burners are of a duplex or some other economical kind, pressure regulators being fixed upon the various branch pipes to control the consumption, which often varies very much at different times, as some divisions are turned off or put on. The waste in this item alone in a large manufactory with some hundreds of jets burning every day would, if carefully examined into, be found rather startling. Even in the case of drinking water where it has to be paid for by meter the waste is often two or three times what there is any necessity for. A man goes to the tap we will say for a can of water. He turns on the water, but, instead of filling it at once and walking away, he rinses it out two or three times, takes a drink, throws the rest away and then fills it and carries it off, totally oblivious of the fact that all the time this manoeuvring is going on the water is running away. Now a push tap, which allows the water to run only while it is pressed with the thumb, would be found economical in such a case, and would at least save a portion of the waste. Even in the offices the differences may be often noticed between a loose and thrifty system of using the stationery. The waste-paper, such as envelopes, etc., is in some places thrown away or burned, while the clerks think nothing of taking a new sheet of writing or foolscap paper, or a memorandum form, to work out their calculations. In others the envelopes, fly-leaves of letters, etc., are set aside, not only for this purpose, but are utilized, as are the backs of useless vouchers, invoices, etc., by printing on them and using them about the premises for instructions to foremen, reports, etc., being as good as new for such purposes. In some drawing offices the amount of tracing paper and cloth wasted, too, is considerably more than there is any necessity for. Some draughtsmen will cut their paper recklessly leaving five or six inches margin, which has to be cut off ultimately, or will put the roll of paper back in a dirty drawer, or on a dirty table, thus making a soiled mark along the outside of the roll, which must be cut off by the next user, thus involving another waste of six or seven inches. Scores of such instances of unnecessary waste might be cited had we the space, which must occur to anyone conversant with workshop practice, but the above will suffice to show our meaning. The greatest cause is carelessness amongst employees and want of sufficient supervision. It is their employer's material and not theirs, and so they do not trouble themselves to economize unless compelled to. The same men when they are at home are most careful of their own coal or gas, and if they are doing any little carpentering job of their own will drop on their knees and search for every nail in the most careful manner; then why not be taught to do so for their masters? In this case, as in many others, a careful and intelligent foreman soon saves the amount of his wages by a systematic encouragement of thrift and a condemnation of those men who are the greatest offenders. A few words will generally suffice to put a check on the practices, while making an example by discharging a few men will have a whole-some effect upon the rest.

CORN AT \$100 PER EAR.

A few weeks ago the Rev. James O. Broxton, of Bloomfield, Ill., had Franklin Releford jailed for stealing five ears of corn. Releford lay in jail several weeks, and was cleared because the corn stolen was worth less than ten cents, and did not, under the State law, constitute a larceny. Releford sued for damages and got them. The damages, costs and attorney fees amount to \$500, which makes the Rev. Broxton pay \$100 for each ear of corn for the theft of which he sought to punish Releford.

BRAZIL'S HIGH TARIFF.

Our consul general at Rio de Janeiro sends to the state department at Washington an informing and suggestive communication dealing with Brazil's tariff duties on imports. The following list includes the articles which the United States could most largely export to Brazil and secure a constant demand for under more favorable conditions:

	Import duty.
Wheat flour, per barrel.....	\$ 64
Maize, per 100 pounds.....	15
Pork, per pound.....	9
Hams, per pound.....	8
Bacon, per pound.....	13
Butter, per pound.....	11
Cheese, per pound.....	9
Shirting, per pound.....	20
Calicos, per pound.....	27
Fenice wire, per pound.....	2
Axes, spades, hoes, etc.....	1 1/2
Carpenters' tools, etc.....	4 1/2
Kerosene, per case.....	1 30
Men's boots and shoes, per pair.....	1 10
Watches and clocks, each.....	1 00
Pianos, each.....	88 50

It will be seen from this selected summary that the duty imposed upon the several staple

necessaries actually exceeds their original cost. If Don Pedro's lawmakers adhere to the Mosaic sanitary code they should prohibit hog products absolutely; but if they tolerate the sale and use of pork in any shape it is hardly fair to make it a luxury by the imposition of a tariff exceeding 100 per cent. ad valorem.

While our surplus food stock and our manufactures are thus barred out of Brazil, it might be worth while to discuss the advisability of levying a discriminatory and retaliatory duty here upon the Brazilian coffees.

At the same time let us not forget that our own beneficent tariff levies a four times heavier duty upon blankets than upon diamonds.—*New York Star.*

THESE lines occur in a prologue written by the notorious pickpocket, George Barrington, for the opening of the first playhouse, at Sydney, Australia, January 16, 1796. The performances on this occasion were entirely conducted by convicts, and the price of admission was a shilling, payable either in money, corn, meat, or spirits, at the market rate.

The prologue opened as follows:

From distant climes o'er wide-spread sea we come,
Though not with much eclat or heat of drum;
True patriots all, for be it understood,
We left our country for our country's good.

"WHAT are you crying for, little boy?" asked the kind hearted gentleman from the country who reads the newspapers.

"I have lost my money, sir," sobbed the child.

"Where did you lose it, my little man?"

"I dropped it in Wall Street, sir."

"Great heavens! Are even children drawn into the great gambling maelstrom? What stock did you drop it in?"

"I dropped it down a cellar grating, sir."

TO WELD COPPER.—The *Mechanical Engineer* says it may readily be done in the following manner: "Get a can of concentrated lye, and put the contents in an iron kettle over the fire. Melt the lye (without water), and when it boils up take it off. Scarf the copper to be welded as you would an iron rod; take a good heat, and use the lye as a flux, dipping the scarfed ends in it just before bringing to the welding heat. We have welded copper rods, 1/2 inch in diameter, with this, so that no one could tell where the junction was."

The electrical units are derived from the following mechanical units:

The Centimeter, the unit of length.

The Gramme, the unit of mass.

The Second, the unit of time.

The Centimeter is equal to 0.2387 inch, or one thousand millionth part of a quadrant of the earth.

The Gramme is equal to 15,432 grains, the mass of a cubic centimeter of water at 40° C.

The Second is the time of one swing of a pendulum making 86,464.09 swings per day, or the 1-86,464 part of a mean solar day.

THERE is sufficient water-power in South Carolina to turn the spindles of all new England, and yet most of the rivers run down to the sea unimpeded in their flow. The streams are never closed by ice, and they rarely ever rise so high as to interrupt the running of the mills that have been established on her banks. On every side there are the crude materials for the manufacture of almost an endless variety of useful and ornamental articles of commerce. The matchless climate and vast resources make South Carolina a paradise for manufactures.

GAUGE COCKS.—When gauge cocks become worn so that they begin to leak, it is very poor policy to continue them in use. They should be at once repaired or new ones substituted. When it becomes impossible for an engineer or fireman to close a cock after "trying" the wren, he is very apt to try it only when he is obliged to, and very naturally, too. The possible risk thus incurred of letting the water get low in the boiler is one that no steam user can afford to take.

PRESSED GLASS.—It is stated that pressed glass is turned out in the Siemens works that is as hard and tough as cast iron. It is far lighter and not affected by temperature, etc. It is intended to make out of this hard crystal, street lamp posts, stairs and gas and water pipes. It is thought these articles can be made 30 per cent. cheaper than in cast iron, but will not, of course, be so heavy.

In the January HARPER'S, by way of contrast with our wintry weather, Mr. Barnet Phillips will describe the balmy delights of "The Cruise of The Walloway" along the Florida coast. The Walloway was a schooner-yacht chartered at Cedar Keys by a party of six Northern tourists, and her cruise of three weeks off the west coast of Florida was made at a cost of about \$400. Those who wish to know "how to do it" for themselves will be especially interested in the paper, which will have charming illustrations from the pencils of R. Swain Gifford and others.

Kansas averaged 42 bushels of corn per acre in 1884. The secretary of the Detroit, Mich., Board of Trade estimates the average cost to the Michigan farmer of raising and delivering wheat in the Detroit market, to be about 80 cents per bushel.

UNITED STATES MILLER.

E. HARRISON CAWKER, EDITOR.

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All Drafts and Post-Office Money Orders must be made payable to E. Harrison Cawker.
Bills for advertising will be sent monthly, unless otherwise agreed upon.
For estimates for advertising, address the UNITED STATES MILLER.

[Entered at the Post Office at Milwaukee, Wis., as second-class matter.]

MILWAUKEE, JANUARY, 1885.

We respectfully request our readers when they write to persons or firms advertising in this paper, to mention that their advertisement was seen in the UNITED STATES MILLER. You will thereby oblige not only this paper, but the advertisers.

CAWKER'S AMERICAN FLOUR MILL AND MILL FURNISHERS' DIRECTORY FOR 1884, published by E. Harrison Cawker, of Milwaukee, Wis., and sold for \$10.00 ten dollars per copy, is now ready for delivery. It shows the result of an immense amount of labor, careful inquiry and studious attention to details. It is without doubt the most accurate trade directory ever published, and will be of untold value to those desiring to reach the milling industry of America.

We glean from this neat volume of 200 pages containing no advertisements, that there are in the United States of America and our neighboring Dominion of Canada 25,500 flouring mills, taking them as they go great and small. The work indicates in about 10,000 instances the kind or kinds of power used by the mills, and the capacity in barrels of flour per day. It further indicates cornmeal, buckwheat, rye-flour and rice mills. It shows that the number of mills in the various states and territories of the United States are as follows: Alabama 433; Arizona 17; Arkansas 343; California 222; Colorado 54; Connecticut 288; Dakota 81; Delaware 98; District of Columbia 5; Florida 66; Georgia 631; Idaho 21; Illinois 1123; Indiana 1089; Indian Territory 14; Iowa 790; Kansas 489; Kentucky 713; Louisiana 61; Maine 28; Maryland 353; Massachusetts 340; Michigan 846; Minnesota 487; Mississippi 386; Missouri 1025; Montana 21; Nebraska 25; Nevada 13; New Hampshire 182; New Jersey 442; New Mexico 32; New York 1902; North Carolina 848; Ohio 1443; Oregon 145; Pennsylvania 3142; Rhode Island 51; South Carolina 274; Tennessee 801; Texas 730; Utah 110; Vermont 247; Virginia 781; Washington Territory 61; West Virginia 447; Wisconsin 777; Wyoming 2.

In the Dominion of Canada we find the record as follows: British Columbia 17; Manitoba 54; New Brunswick 198; Nova Scotia 12; Ontario 1160; Prince Edward's Island 39; Quebec 631. Total 25,500.

Taking the work throughout, and it is highly interesting to all concerned in the trade, and we take pleasure in recommending it.

See Page 41.

THE Minneapolis millers have not entirely discarded the use of millstones, there being 141 run of stone now in use in the various mills in that city.

D. G. TEPPER, Esq., publisher of *The Millers' Journal*, New York City, called on us Dec. 11. He contemplates changing his weekly journal to a monthly.

THE failure of THE MILLER CO., of Canton, Ohio, is announced. It is an incorporated company with \$60,000 capital. The company has been manufacturing Rider's wheat break machine, steam pumps, etc.

THE following report comes from Marseilles, France: At a meeting of twelve hundred representatives of the milling industry, a protest was entered against the raising of the import duty on grain.

HON. J. A. LEONARD, United States Consul-General at Calcutta, India, in a late report to the Department of State, conveys some interesting information. In short, the average wheat acreage in India is about 26,000,000 acres, producing in a fairly good year about 244,000,000 bushels. With a good rainy season following an average wheat crop, so as to secure an autumn harvest, one-fifth of the wheat crop can be spared for export without materially raising prices. With low prices prevailing in Europe, the exports have fallen off considerably from those of last year, and they probably will not increase until European prices are more favorable.

SPECIAL INDUCEMENTS TO SUBSCRIBERS.

If you are not already a subscriber to the UNITED STATES MILLER, now is your time to subscribe. We call your especial attention to our announcement on page 10. It may be summed up as follows:

We will send the UNITED STATES MILLER post-paid to any address in the United States or Canada for one year and a copy of Ropp's Calculator in plain binding for \$1.00, or a No. 3 Calculator and the paper for \$1.50; or a copy of Ogilvie's Popular Reading No. 8 and the paper one year for \$1.00; or the books entitled

"The Great Empire City" or "Fifty Complete Stories" and the paper for one year for \$1.00; or the "New American Dictionary" and the paper for one year for \$1.60; or "Moore's Universal Assistant and Complete Mechanic" and the paper one year for \$2.75. Our readers should not fail to take advantage of these offers, which remain open until we announce to the contrary in our columns. All remittances must be made by postoffice money order or registered letter. Remittances made otherwise will be at your own risk.

THREE HUNDRED AND NINE WORDS WRITTEN ON A KERNEL OF WHEAT.—The "Allgemeine Muehlen und Maschinen Industrie Zeitung," says: In Reimnitz-Sarat, there is a kernel of wheat put on a needle in a glass tube, on which there is a quotation from Victor Tiersot's Works on Vienna which contains 309 words written with a pen, and at the same time so clearly, that most of the words can be read with a small microscope. The author of this work of art is a certain J. Sofer, who improved his time, while being in a synagogue, to become so perfect in miniature penmanship. Besides using wheat kernels, he uses the edges of visiting cards to practice his art on.

THE Portland (Ore.) *Journal of Commerce* urges Oregon farmers to stop raising wheat and turn their attention to dairying. The latest reports show a large decrease in the acreage sowed to wheat in all the winter wheat states, and, doubtless, there will also be a great decrease in acreage in the spring wheat states. The prospects indicate, therefore, that even with a favorable crop year in 1885, there will be a smaller crop of wheat than during the year 1884, while the amount required for home consumption will be greater. These conditions appear to point to higher prices for wheat and flour in the near future.

DURING the past nine months, Great Britain has imported 11,961,374 cwt. of flour, 68 per cent. of which was received from the United States, 11½ per cent. from Germany 10½ per cent. from Australia and 10 per cent. from other countries. Statistics indicate that the American export of flour will soon be equal in value to that of wheat. Wheat-flour is now in value the third leading export of the United States, cotton being first and wheat second. For the year 1881-2, the value of cotton exported is placed at \$199,000,000; wheat \$112,000,000 and flour \$36,000,000. In 1882-3, the cotton exports were worth \$247,000,000; wheat \$110,000,000, and flour, \$54,000,000. In 1883-4, the cotton exports are placed at \$197,000,000, those of wheat at \$75,000,000 and of wheat flour \$51,000,000.

UTILIZING STALE BREAD.

The persistence shown by the Parisian bakers in keeping up the price of bread, notwithstanding the great fall in the price of flour has drawn attention to the confraternity and brought out some old facts in connection with the trade. In addition to the bakers proper there are, it seems, a number of second-hand bakers in Paris, who trade in the broken scraps which daily accumulate in all large establishments—such as hotels and colleges—where bread is consumed on a great scale. This refuse is bought by weight, the best bits are picked out and sold to the cheap restaurants, which turn them to account in various ways. The bread soup and other culinary concoctions on which customers are regaled in the cheap restaurants, where a dinner of courses is to be had for 20 cents, are indebted for a portion of their ingredients to this source of supply. The similar and less profitable morsels are baked a second time and ground in a mortar. The powder is then sold to the pork butchers, who use it to garnish the hams and cutlets which present such an appetizing appearance in their shop windows.

ITEMS OF INTEREST.

A COMPETENT and experienced millwright gives, as the result of his experience of 38 years, that iron pulleys should be faced with leather, particularly if the belt is not to be shipped, as from fast to loose pulley. His plan is to cut the leather of the proper width, slightly wider than the pulley face, soak soft in water, and then apply it to the pulley by stretching, using copper rivets to secure the butt joint and an occasional rivet on the edge, the leather is put on flesh side outward. Next to the leather face he prefers a built-up wooden pulley, the segments of wood to be secured in an iron frame, with the ends of the grain outward. Such pulley faces, he claims to be greatly superior to polished iron, or to wood with the grain horizontal.

"ONE of the greatest mistakes," says an English architect, "in outside chimney building is the use of porous bricks and thin walls, by which the smoke, becoming cool in its ascent, by virtue of its heaviness descends into the room. It is almost needless to point

to the necessity of building chimneys, particularly the stacks, of unporeous bricks jointed in cement, and in lining the flue with fire-clay pipes. Terra cotta is the best material for stack construction, as the flues can be rendered impervious."

A HEAVY wheat train pulled into Fargo by one engine, a few days ago, on the Northern Pacific Railroad, consisted of 110 cars loaded with wheat. This would make, allowing 550 bushels to the car, a weight of 3,630,000 pounds, while the cars weigh 2,720,000 pounds, making 6,350,000 pounds pulled by one locomotive, or about 3,180 tons. The train was over three-quarters of a mile in length.

BOOK NOTICES.

We have received the first number of a new monthly journal entitled "Power." In the announcement of the publishers, they say:

Among the subjects treated will be how to buy, set, fire, and clean boilers; how to select, set up, run, repair, and take care of steam, gas, and hot-air engines, and all other motors; to choose, lay out, erect, and care for lines of shafting, with their accompanying pulleys, belting, gearing, etc.

The new journal will certainly have enough subjects to discuss. It is published by the American Railway Publishing Co., New York, and Robt. Grimshaw, M. E., is editor in chief.

"THE BOOK-WORM."—A unique, handsome and delightfully readable little monthly magazine, containing for the year over 300 pages and many fine pictures, all for 25 cents a year, is a recent characteristic product of *The Literary Revolution*. Each number contains attractive selections from some noted book,—the last presents Prescott's famous chapter on the "Spanish Inquisition." What will interest a vast number of book-buyers will be the regular monthly news of the *Revolution's* progress,—an enterprise that has wrought wonders in the book world. A specimen of THE BOOK-WORM will be sent free to any address. JOHN B. ALDEN, Publisher, 303 Pearl st., New York.

SCOTCH (THICK) FLOUR BARM FOR SQUARE AND FANCY BREAD.

Commonly Known as Parisian Barm.

BY A GLASGOW BAKER.

I purpose showing in this article that Scotch bakers can and do make healthy barm, and keep it so without the slightest scientific knowledge, being solely guided by sight and taste. The grounds for this statement I shall fully advance after giving the recipe.

Ingredients.—Fifteen pounds malt crushed, 4 lbs. English hops, 3 qrs. home winter wheat flour, 1 qr. hard spring wheat flour (either Baltic or American.)

Mode.—Boil hops with 3 gallons water for 15 minutes, with this liquor mash the malt; temperature, 165°; allow it to be in a tub for 4 hours, then wring or squeeze the malt by hand, keeping in mind that the last drops are the most valuable. Strain through a sieve of 6 holes to the inch, add 2 gallons hot water. The liquor should now be about 130°, which is the proper heat for the batter. This is made by adding flour, and doughing up the liquor to the consistency of a dough for morning rolls as made in Scotland, or Vienna rolls in England. Your tub, containing the batter, must be 24 in. wide by 27 in. deep. It must now be drawn close to the boiler for you to draw your water, which should be 220°. For stirring use a stick of hard wood, 1½ in. in diameter, 4½ ft. long. Two men must be standing by, as stirring must be performed at such a speed that the strongest man cannot continue stirring more than 3 gallons without a rest. The operation should be continuous, each man taking the stick alternately as the other rests. The most trying stirring is when the third 3 gallons have been added, because here the scald must take place. If you are to have perfect scald 50 to 60 seconds will suffice. The stirring speed should be 120 to 130 strokes per minute. You will now know whether your water has been perfectly boiling, as the scald will be so thick after 45 seconds stirring that the strongest man will have difficulty in driving the stirring-pole through it. The mixture has now lost the appearance of raw flour and water, and assumed a rich yellow hue, and has the sweet taste of cooked flour. The critical stage has now been passed. Continuing the stirring at 70 to 80 strokes to the minute, you add in two equal portions 6 gallons more water, stirring about 70 seconds for each of the 3 gallons. Your scald is now made and should be put in a cellar with a fair ventilation, and at a temperature of not less than 60° in winter, and the nearer this temperature is kept to in summer the less difficulty will arise in keeping the barm sweet and regular. After standing 4 hours several rents will appear across the surface, and little patches of white froth will rise from these rents. These will continue to grow larger for the next 18 hours. The scald may be stored from 24 to 36 hours old provided the heat is not over 80° for weather such as has been experienced in November, 1884. The mode of storing barm is as follows: Put this quantity of scald into a tub double the size of that used for scalding, add 8 gallons of healthy Parisian barm, and 14 lbs. fresh flour, stirring well, cleaning sides of tub thoroughly. It will be up its full height in the tub in about 10 hours, and in from 18 to 24 hours time it will have dropped in the tub about 6

inches. It should at this stage be divided into coolers—tubs 24 in. wide 12 in. deep. Twelve hours after this it may be used for English or fancy bread, but for Scotch square batched bread it requires 48 hours in the coolers to mellow it sufficiently. New barm gives too much bulk, and cannot be skinned or piled, as the Scotch bakers term the texture of the loaf. Barm for storing should not be more than four days old, that is from the date of storing.

I have in the foregoing treated of the methods of producing healthy barm, and I now offer a few hints as to the signs by which practical men know whether barm is or is not healthy: When the barm comes up well in the tub, with thousands of little bells coming up to the surface, and breaking as they come, driving the large dull and floury bells to the sides of the tub, where they disappear slowly. When barm is ripe for cooling, clear bells, or, as bakers term them, "black bells," appear on the clear surface. They appear, at first sight, "black" on a white surface; but, on looking into them, you see they are simply a transparent bubble without trace of flour. Barm makers have got to know, from a long course of observation, that these are the sure signs of perfect healthy barm, and they state they have never seen bad bread made from barm of this description. The term "Lifeey" is applied to healthy barm; the term "Dead" is applied to barm when all the active, healthy little bubbles or cells cease to come up and explode on the surface. By the very face of it, when in this state a practical man on looking at it will shake his head, and say, "It is gone; I will not use it." He will then taste it, and, if the taste bears him out, he will make up his mind to put it down the sink. This is the knowledge the practical man has, and his discoveries, it will be observed, are made through sight and taste only.

It will naturally be asked? "Why don't you show us that your practical man can keep his barm healthy, and how he does it?" This is how it is done. When he sees the bubbles rising feebly, he at once says there is want of "life" or "forces," and will infuse fresh life, by storing half from a young barm 36 hours old, and half the 48 or 72 hours sickly barm. This will, under ordinary circumstances, bring it right, but if the appearance is still dull, he will keep adding every time he stores a new scald, a larger proportion of the young barm, till he is satisfied he has brought it round. The only exception to such is when barm gets fired, through a thunderstorm, in which case, as a rule, it is completely killed and cannot produce sweet bread. It often happens, however, in a cellar with, say, 10 tubs of barm, that only half or so are affected by the electric fluid, the remaining ones keeping quite "healthy." In such a case the baker can start fresh lots from the uninjured tubs, but if all are fired, then he must go and get a store of "healthy" barm from some neighbor who has been less unfortunate than himself; but here again he must use his judgment as to whether his friend's barm is "healthy," and I have never known a practical man deceived in such. Many of the men who make the barm in the largest bread factories in Scotland, have no scientific knowledge of barm. They never read a book on the subject, nor have they ever heard the matter spoken of. Many of the barm makers in Scotland started as careful lads, entrusted with the scalding of the tubs with boiling water, which is most essential, in order to kill the particles of old fermentation; and I have known such lads who could neither read nor write become highly successful barm makers.

This article is not written to show that science is useless to bakers, but is a simple statement of facts, showing the stage of perfection at which practical men had arrived before scientists took the subject in hand. I have known such bakers who did not require to change their store for two years at a time, and have had successful runs of sweet barm for years. I trust I have made myself sufficiently clear, and will be pleased to answer any questions on the subject that your readers may think fit to ask.

GOOD ADVICE FROM AN HUMBLE TAR.

When William IV. was high admiral of the fleet he happened to be in Portsmouth one day, and in his walk he came across a drunken tar embracing a lamp-post. The tar took no notice of the high admiral, who being rather hurt at this want of courtesy, turned around and said:

"My man, do you know who I am?"

"No, I don't."

"I am the lord high admiral of the fleet."

"A d—d good berth, too, and mind you stick to it," was the reply.

We have received several inquiries during the past two months for the address of manufacturers of suitable machinery for making pearled wheat and barley. Such manufacturers will do well to send us their addresses.

THE CHEMISTRY OF BREAD-MAKING.

BY PROFESSOR CHARLES GRAHAM, D. SC.,
F. I. C.

[CONTINUED.]

The baker then proceeds to the next stage, which is the preparation of the sponge, or "stirring the sponge." In making the sponge one-fourth, or according to some bakers one-third, of the flour is taken, placed in the trough, the ferment added through a sieve which retains the potato-skins, the water in the ferment and sponge being about 30 quarts; bear in mind I am always speaking of the sack of 280 lbs. of flour. The quantity of water, however, varies slightly with the kind of flour and slightly with the baker's own particular practice. The other ingredient is salt. Now many London bakers do not use salt in the sponge stage, nor is it needful in the very highest classes of flour; others, however, prefer to use some of the salt, and the quantity of salt therefore used in this stage varies. The amount altogether used for a sack of flour is 3 lbs., or 48 ozs., that is $\frac{1}{4}$ oz. for each quarter loaf. Now salt acts as a check upon fermentation. The more salt you add to the sponge stage the more you check the degradation or breaking up of the albuminoids. The sponge being made ferments, and in about five hours it breaks, carbonic acid being given off, and in an hour it rises again, and again breaks. This last will depend on the temperature. After the second break, the remainder of the flour, be it three-fourths or two-thirds, according to the practice of the baker, and the remaining portion of the water, is added; the total quantity of water for the whole sack is 60 quarts. These are thoroughly mixed together, and in the dough stage many bakers, as I said, add the whole of the salt. Those, of course, who have used part of the salt in the sponge stage, simply add the remainder. Of late years machinery has been invented to do away with the mixing of the dough; it is very hard work, and I should be glad for those of you who have time to look not only at the very useful mixing machine of Mr. Pfeiderer, but also to look at the mixing machine of Melvin, of Glasgow, in Mr. Marshall's model bakery, which consists of a number of revolving cutters which mix up the dough. The dough well mixed is then left for an hour, it rises, it is then scaled, that is to say, weighed and put in the oven, where it remains for one hour and a half, the atmosphere of the oven being about 300° to 450°. The temperature of the bread, I need hardly say, is not 400° but much less, appreciably not more than 212°, but it may be a little over, owing to the resisting action of the crust, but at that temperature you know water boils, and therefore the temperature could not be higher. Before I pass on to a description of the scientific phenomena underlying these processes, I will briefly refer to the manufacture of fancy bread. Bakers, of course, differ in their manufacture of fancy bread in the same way as they do with ordinary household bread, but the following will give you an idea of the general method. In the first place a "ferment" is prepared as before, that is to say, boiled potato with a small quantity of flour, and with brewer's yeast. Having prepared the ferment; in the sponge state, the baker uses a large quantity of German yeast, and in this way gets a very rapid fermentation and a large, light, porous bread. In regard to the chemistry of these operations, the fruit, that is to say, the boiled potato, yields ferment food, and thereby, by the action of the yeast on the soluble albuminoids of the flour, gives a rapid formation of maltose and dextrine. In 8 lbs. of potatoes there are only 2 lbs. of starch so manifestly the baker does not use this small quantity for the sake of cheapness. It is because it is one of the largest of all starches, and therefore it is one of the best means of preparing albuminoid and sugar food for the active stimulus of yeast growth. The ferment stage increases the production of these albuminoids and sugars, and the yeast is in this way greatly stimulated; but another object that I ought to mention that the London baker has in making this preparation of the ferment is that he largely increases the amount of yeast. This method of feeding yeast during this number of hours, is a method of making a considerable amount of yeast out of the one quart that he takes. In the sponge state we have a very active fermentation going on; the sugar there is broken up into carbonic acid and alcohol, and there is a rapid action; and it is in this particular stage which lasts so many hours that inferior flours turn out so badly, because they produce more and more soluble albuminoids, and those give a high color to the final product. In the dough state, which is practically the inert stage, because in the dough stage we have added all the flour, and only 30 more quarts of water; we have also a less period of time allowed, only one hour, and the result is that very little further change goes on. If the flour has withstood the sponge stage without injurious result, it will perfectly well stand the dough stage. The objects im-

ed by the baker being to obtain good aëration, numerous small cavities of gas, in other words to give a well-piled loaf, also to avoid color, because color always gives rise to a suspicion of inferiority of the flour; and lastly, the baker's aim is to obtain a nice aroma, a fine nutty taste, such as indeed cannot be got by any other method than that which I have been describing.

Fermentation is a subject that has been a source of considerable interest and speculation. I need not, however, do more than simply call your attention to our present knowledge on the subject, for which we are mainly indebted to Pasteur, in that it was he who first of all pointed out most clearly that it was due to minute organisms that fermentation was brought about. M. Pasteur proved that by withdrawing the internal contents of the grape that those contents would not spontaneously ferment, but that if you took a little cotton wool, and rubbed the outside of the skin and added that to that which was withdrawn, the fermentation was set up. We are all now of the same mind that fermentation is brought about by the action of living organisms, *saccharomyces*. The fermentation of the must of grape, which is brought about spontaneously, is not the only instance of spontaneous fermentation. Leaven bread, which I have spoken of, originally arises in this way, and is to some extent the result of spontaneous fermentation. The production of the old sour beers of Dorsetshire, the production of Lambick, or Faro, is of the same nature. Only the other day I had occasion in this exhibition to taste a sample of Lambick beer, which is made by taking the wort of malt and leaving it to receive whatever dust falls into the large vat, and in the course of one or two years the product, which they call Lambick or Faro, is obtained, which is excessively sour, because all kinds of ferments have brought about the change, not merely the alcoholic ferment. The yeast organism is one of considerable interest and I have a diagram of the indications of the English country yeast, and Burton yeast, and there is also a drawing to represent the acetic acid organism, the lactic organism, and the organism which produces butyric acid, and also the organism which produces the rosy fermentation, the manite and gum, instead of alcohol and carbonic acid. The yeast organism under a good microscope will be found to have a cell wall. You will find inside a space such as I have indicated, which is termed vacuole, is not really a vacuole space, but is filled up with a very thin protoplasm, or, as Professor Huxley calls it, the physical basis of life. The other portion is also filled up with protoplasm. Yeast contains a little granulated protoplasm. When it has been kept a long time it gets exhausted, and part of the albuminoid compounds or protoplasmic matter gets converted into other bodies, and they ooze out, and the result is that in looking through a microscope at the organism, instead of having to look at a well-filled cell, we have a thinner cell to look through, and the result is that the granulated protoplasm is seen much more distinctly. I have, therefore, given a rough representation of old yeast, or yeast that is exhausted. The conditions necessary for active yeast growth are that we should supply broken-down albuminoids and peptones for its nourishment, a certain quantity of phosphate of potash, lime magnesia, together with a little air.

The microscope not only is of value in examining different kinds of flour for the purpose of seeing what mixture of other cereals have been added besides wheat, but it is also of the highest importance to the baker in judging of his yeast, because he will be able to see whether he has the organism which will produce acetic acid which would make vinegar or lactic acid, which would produce sourness, or even a worse organism still.

The particular process I have been describing for making bread, then, depends on making carbonic acid gas from the decomposition of the sugar which has formed in the previous stages yielding carbonic acid gas and alcohol. I have said very little about alcohol; it is with the carbonic acid that we are chiefly concerned. There are other methods, however, of aërating bread without the carbonic acid of fermentation; bicarbonate of soda and hydrochloric acid, when added in proper quantities, so that one exactly neutralizes the other, or at least so that the bicarbonate is slightly in excess, is another method of making carbonic acid; or there is Dr. Daughlish's plan for making aërated bread, which depends upon aërating the bread with carbonic acid made in chemical ways, not by making use of the yeast organism. The hydrochloric acid and bicarbonate of soda has very grave objections, because it requires very great care in mixing them so that you should not have too much bicarbonate on the one hand, or too much hydrochloric acid, or spirits of salts as it is called, on the other. Dr. Daughlish's method has its merits, because you do not introduce anything into the bread like hydrochloric acid or bicarbonate of soda; it is mere-

ly carbonic acid that is introduced, and it has for some years been used in London, and one or two other towns. For a long time apparently it had no very great measure of success. It is very interesting, because this method is an entirely mechanical one, and it gets rid of many of the objections which have been brought to the fermentation plan and to the hand method of kneading. I understand that during the last two or three years a greater sale has been found for aërated bread, which shows that the objections which I have for it have not been entertained by those who like it. I find that aërated bread is very nice the first few times of eating it, but after a time I long again for the nutty flavor of the well-fermented bread.

High-class flours and a skillful baker will make good bread. The real difficulty is to make good bread with flours that are not derived from elaborated wheats, and this is a point that I wish to say a few words about before concluding. The Council, of course, desire the greatest extension of knowledge throughout the country, and inasmuch as we only grow one-third of the wheat we eat, and are always obliged to import two-thirds, it seems to me that in seasons that are not very favorable we have a remedy in our hands. In other words, as I have pointed out to you, where it is that so much injury takes place is in the sponge stage. It seems that we should divide our flours. Every miller should send out two distinct flours. A few years ago I recommended that, and there are many millers who do that now, and many bakers who use two distinct flours; but I wish the recommendation I made at the Society of Arts should by means of the cheap publications of this Exhibition be more generally known. In order to show you that this is a very feasible plan, I have asked Messrs. Hill of Bishopsgate Street, to make me an experiment to illustrate it. I preferred not to have anything to do with it myself, in order that it should not be a lecture experiment in which one is liable to exaggerate. I asked Messrs. Hill through Mr. Dunham to get some good American flour and some soft Norfolk flour—not bad flour only rather weak. Then I asked them to have them in the proportion of one-quarter American to three-quarters Norfolk. One set of loaves has been made in which the American flour has been kept separate, and only used for the sponge state, whilst in the other experiment the American and Norfolk flours were mixed and used both for the sponge and for the dough. Loaves were made at precisely the same time, the same flours, the same quantity, the same salt, and baked at the same temperature, and here is the result. Those who are interested in the matter will see that in the case where they were mixed the loaf has not risen well, and in addition to that it is not so good in color.

With reference to the use of brown meal, or whole meal, I would suggest either that you make your sponge of very fine sponge flour, as a baker would term it, good hard whites, and then in the dough stage mix up the whole meal into it, or if there is an objection to this that it is diluting your whole meal; then I would suggest another matter of getting over the difficulty. Make first of all a ferment, and in the ferment take care that you use potato and flour as I have indicated; then add in the second stage a small quantity of glucose, using however in the sponge nearly all the salt, and using a large quantity of yeast, pushing on therefore the sponge stage rapidly; then mixing up the remainder of the whole meal, and rapidly making your bread and baking it.

I did intend to call your attention to some drawings of the Vienna oven, to show how foreign rolls are glazed, but I will not detain you any longer. I will only ask you when you have the opportunity at the Exhibition to go round to the east corridor to Mr. Hill's exhibit, and there are one or two others, who are also making these foreign breads, and you will there see the process of glazing these rolls. It is done by steam, which is what we term super-heated. It is forced into the oven which is at a temperature of at least 500 degrees, and the steam coming against the hot walls of the oven becomes super-heated, it then passes over the surface of the roll, and glazes it or covers it with dextrine. I will only detain you with two or three other remarks. In the baking the cells of the starch are burst, which renders the bread easily digestible, the carbonic acid gas bubbles are enlarged, and that together with the expansion due to the steam enables the bread to be well piled. The crust keeps the moisture in, and from the elaborate experiments made by Lawes and Gilbert, Dr. McLagan, and our distinguished chairman many years ago, we now know the exact percentage of moisture, that may be found in ordinary quarter loaves. To put it in another way, 100 lbs. of flour will give about 185 or 186 lbs. of bread; in other words, a sack of flour will give 96 loaves. I dare say one or two practical bakers would say that fine flour would give even more.

I have called attention to the chemical phenomena underlying a very important industry; I have asked your attention to this experiment made for me by Messrs. Hills, and I will also ask you to notice the exhibit of Mr. Bonthron, No. 179, in the main corridor, to see the character of his crude gluten. I have some on the table, some dry, and some mixed with water, and I would ask you to notice the excessive tenacity of this gluten. If I have contributed anything to show how wheats that have not been well elaborated may yet be used with our foreign importations; if I have in any way, not merely to this audience but to the still larger audience I hope to address by means of the Exhibition publications; if I have called your attention and that of others to interesting exhibits, which you will find all through the building connected with bread and corn; and if I have shown you the importance of science to the advancement of this technical art, and caused you to take an interest in the scientific phenomena on which it is based, I shall not have failed in the object with which I came here to-day.

The chairman in moving a vote of thanks to Professor Graham for his exceedingly interesting, scientific and practical lecture, remarked that if none but the best qualities of wholesome food were used, the prices would evidently rise to such an extent as to seriously interfere with the supply; but science was able to teach how to employ inferior qualities of that which was nevertheless essentially wholesome, so as to succeed in producing the result which, if not quite the best, was at any rate of a highly satisfactory character, and all must feel that Professor Graham's efforts towards the elucidation of that problem in the case of the conversion of flour into bread, were worthy of the most hearty vote of thanks which could be accorded to him.

Mr. Bonthron, as a practical baker of forty years' experience, begged to second the vote of thanks. He was very pleased to find science following so closely on the heels of observation and experience. He saw several practical bakers present, and he would call their attention to the very important consideration arising out of what they had heard, viz.: the importance of the time to be given in London sponge to first-class flour, in order that the proper change might take place. This was a matter he had a great deal of difficulty in impressing on his workmen, but there was no doubt that the fine flour required longer time to undergo the necessary changes, and it must not be supposed for a moment that it could be done hurriedly. You could not ripen a grape properly except by the natural sun and by the natural time, and the same thing applied to bread making. He had been much struck with the diagram of the ferments. It was well known that heat accelerated and cold retarded fermentation. In this particular season of the year yeast must be in a condition in which it was necessary that every care should be taken to nourish it. There was a serious danger of putting yeast which was weakened by warm weather into too cold a ferment. It should be tenderly nourished, always put in with a good body of food for it to work upon, never into the water, but always after the flour and other matters were put in.

STORY OF A CHIP.

An interesting story is told in connection with the old state prison at Charleston, which shows how small and insignificant a thing may give liberty to a prisoner. A convict had been sent to imprisonment for fifteen years for committing a series of burglaries, and had served between three and four years, when one day he brought a small chip of wood from the shop where he was engaged in labor to his cell. This fact was not worthy of notice at the moment.

When, however, the prisoner with others had been marched to their cells, he placed the chip in such a way as to prevent the bolt of the door of his cell from fastening. The officers on duty made their usual inspection saw each man in his cell, and so reported.

After the inspection had been made the convict in question opened his cell door, closed it again, and passed quietly out of a side door into the yard. In a moment he had gained the shop where he worked. Here he put on a pair of overalls belonging to one of the instructors, and from there he got upon the prison wall, and entering one of the guard-houses he found an overcoat which he donned. He was now ready to bid adieu to the prison. His movements were in no way slow; for he knew that at any moment his absence might be noticed, and the officers be upon his track. Leaping from the wall the convict was soon in the street and off "for parts unknown."

At 1 o'clock, when the prisoners were to return to the shop for afternoon, the absence of the escaped man was noticed, and although diligent search was made and the usual reward offered for his arrest the fellow was never captured, but made his way to Halifax, where to-day he is engaged in a legitimate business. —*Boston Globe*.

RYE AS A FARM CROP.

During several years rye has not been a favorite crop in this country. Our native population prefer a strictly white bread, which can not be made from rye. Indian corn has taken its place as a food for fattening animals. It has also been generally used for feeding the hogs. In colonial days as well as for some time after the Revolution, rye was commonly employed for making alcohol and whisky. As the west became settled corn took the place of rye for making these articles. In the new England states, where "Boston brown bread" is extensively used on tables, rye meal was formerly employed for mixing with corn meal. During the past few years, however, wheat middlings have commonly taken its place. In quality they are greatly inferior to rye meal, but their cheapness causes them to be used. The Germans and Scandinavians who come to this country continue to eat rye bread in preference to that made from wheat flour. This practice is obviously the result of early experience, and may not continue beyond the present generation. At present, however, the preference of the people from central and northern Europe for rye bread is strong. A few years ago they continued to buy rye flour although it was considerably higher than the best wheat flour. That rye bread is in some respects superior to that made from wheat flour is obvious. It has an agreeable sweet flavor that wheat bread does not have, and also retains moisture longer after it comes from the oven. Still the prospect that rye will ever take the place it holds as a material for making bread in central and northern Europe is very poor. Neither is it likely that rye will be extensively used as food for the inferior animals or in the manufacture of alcoholic drinks.

While it is improbable that rye will ever be a popular crop with "bonanza farmers," there are good reasons for believing that its production will prove profitable to many who cultivate land on a somewhat small scale. Considerable rye can be used by the general farmer to excellent advantage. Some rye is desirable for food for human beings, if for no other purpose than to afford variety. It is an excellent food for fowls of all kinds. Rye is very beneficial to horses when fed in limited quantities. It furnishes excellent food for young animals of all kinds. Hogs will thrive on rye in all stages of their growth. All who have had experience in carp culture recommend rye in preference to all other grains for feeding these fish. Rye can be raised in locations and in soils where fair crops of wheat can only be produced by the expenditure of much labor and the application of liberal amounts of valuable fertilizers. It is the best crop for lands that are very sandy and deficient in the elements of fertility. It is not an exhaustive crop like wheat or flax. The plants are more hardy than those of wheat, and the grain is not as subject to injury as barley. But a small amount of seed is required. It yields more than wheat, and is produced at a smaller cost. It is less likely to be injured by insects. Growing rye furnishes excellent winter and spring pasturage. It is also an excellent material for soiling. It is ready to cut several weeks before clover and early grasses are. Next to red clover it is the best crop to plow under for the purpose of enriching the soil. Rye produces more straw than wheat or barley, and it is much more valuable. Besides being useful for feeds, it is valuable for making thatch, packing goods, tying up grape vines, and filling beds. In the matter of general utility there are few crops that will compare with rye.

POPULAR MISCONCEPTIONS THAT OUGHT TO BE OVERTHROWN.

A writer in *Lippincott's Magazine* thinks that the health of the people would be brought up to a better condition if they were educated out of the following fallacies:

The idea that cold baths are healthy in winter and dangerous in summer.

That rain water is more wholesome than "hard" water.

That bed-rooms must be heated in cold weather.

That the misery of everlasting scrubbing and soap-suds vapors is compensated by the comfort of the lucid intervals.

That a sick-room must be kept hermetically closed.

That it pays to save foul air for the sake of its warmth.

That "draughts" are morbid agencies.

That catarrhs are due to low temperature.

That even in midsummer, children must be sent to bed at sunset, when the air begins to be pleasant.

That an after dinner nap can do any harm.

That the sanitary conditions of the air can be improved by the odor of carbolic acid.

That there is any benefit in swallowing jugfuls of nauseous sulphur water.

That rest after dinner can be shortened with impunity.

That out-door recreation is a waste of time.

That athletic sports brutalize the character.

That a normal human being requires any other stimulant than exercise and fresh air.

That any plan of study can justify the custom of stinting children in sleep.

That the torpor of narcotism is preferable to insomnia.

That the suppression of harmless recreation will fail to beget vice and hypocrisy.

That stimulation is identical with invigoration.

That fashion has a right to enforce the wearing of woolen clothes in dog days.

FARMERS AND THE ELEVATORS.

Farmers all through the Northwest are bitterly complaining of the alleged exactions of the elevator owners, the railroads and the millers. In the minds of the farmers, these three are leagued together in Minnesota and Dakota to oppress the farmer in every possible way. It would certainly seem that the millers of the neighborhood could not have a common interest with the grain men, who would be their competitors for the grain. And in fact most of the complaints made by the farmers are found, when sifted, to have only a small foundation for the superstructure of abuse which they build against the elevator men and the railroads. All elevator men and elevator agents may not have been exactly just in all cases, but the great complaint of undergrading is due to the fact that the elevator man must protect himself against the possibility of his grain being graded down at Minneapolis or Duluth. Farmers certainly have not a reputation for long-suffering. Few of them recognize the possibility of his own wheat, raised by the sweat of his brow, being dirty, or damp or smutty. Each farmer's wheat is just as good as his neighbor's wheat. Most frequently the farmer is blind to differences in quality, and with him wheat is wheat. The grain man or miller who is obliged to get value out of it, may often be hypercritical, but he certainly is a better judge of grades.—*Am. Elevator*.

CAPACITY OF MINNEAPOLIS MILLS AND ELEVATORS.

[From the Northwestern Miller.]

The milling capacity of Minneapolis has shown a large increase during the past year, and at present stands as follows:

WEST SIDE.		
NAME OF MILL.	OPERATED BY	1884. BARRELS.
Anchor.....	C. A. Pillsbury & Co.....	1,200
Catawba.....	D. R. Barber & Son.....	550
Columbia.....	Columbia Mill Co.....	1,200
Crown Roller.....	Christian Bro. & Co.....	1,900
Dakota.....	H. F. Brown & Co.....	310
Excelsior.....	D. Morrison.....	1,200
Galaxy.....	Cahill, Fletcher & Co.....	1,000
Holly.....	F. S. Hinkle.....	275
Humboldt.....	Hinkle, Greenleaf & Co.....	800
Minneapolis.....	Crocker, Fisk & Co.....	800
National.....	Citizens' Bank.....	150
Northwestern.....	Slide, Fletcher, Holmes & Co.....	1,500
Pallsade.....	Washburn Mill Co.....	1,500
Pettit.....	J. A. Christian & Co.....	1,300
St. Anthony.....	Morse & Sammis.....	500
Standard.....	D. Morrison & Co.....	1,500
Union.....	Morse & Sammis.....	300
Washburn A.....	Washburn, Crosby & Co.....	3,500
Washburn B.....	Washburn, Crosby & Co.....	1,000
Washburn C.....	Washburn, Crosby & Co.....	2,000
Zenith.....	Slide, Fletcher, Holmes & Co.....	800
EAST SIDE.		
Pillsbury A.....	C. A. Pillsbury & Co.....	6,200
Phoenix.....	Stamwitz & Schober.....	275
Total daily capacity.....		29,780

Our storage capacity has been materially added to during the past year, but is yet inadequate. The need of more storage room, however, does not seem likely to go long without being met, as there are several schemes now in the embryo state that are designed to make ample provision for the present deficiency. The appended table gives the names of Minneapolis public elevators and their capacities:

ELEVATOR	OPERATED BY	CAPACITY. BUSHELS.
A1.....	Minneapolis Elevator Co.....	800,000
A2.....	.....	1,250,000
B.....	Milwaukee & St. Paul R. R.....	900,000
C.....	H. W. Pratt & Co.....	140,000
D.....	Milwaukee & St. Paul R. R.....	200,000
Central.....	G. W. Van Dusen & Co.....	300,000
Pillsbury.....	C. A. Pillsbury & Co.....	425,000
Lowry.....	Street Railway Co.....	150,000
Baker-Potter.....	Baker, Potter & Co.....	600,000
Transfer.....	Northwestern Elevator Co.....	535,000
Total.....		5,280,000

*Just completed, but not yet in use.

†Located between Minneapolis and St. Paul.

The following is the storage capacity of the mills:

		BUSHELS.
Anchor.....	.....	7,500
Columbia.....	.....	70,000
Crown Roller.....	.....	75,000
Catawba.....	.....	28,000
Dakota.....	.....	2,000
Excelsior.....	.....	7,000
Galaxy.....	.....	60,000
Holly.....	.....	2,500
Humboldt.....	.....	25,000
Minneapolis.....	.....	19,000
Northwestern.....	.....	35,000
Pallsade.....	.....	20,000
Phoenix.....	.....	20,000
Pillsbury A.....	.....	126,000
Pettit.....	.....	14,000
St. Anthony.....	.....	8,000
Standard.....	.....	30,000
Union.....	.....	4,000
Washburn A.....	.....	110,000
Washburn B.....	.....	65,000
Washburn C.....	.....	65,000
Zenith.....	.....	20,000
Total.....		822,000

The only change that has lately occurred in the storage capacity of the mills has been in the case of the Pillsbury A. A hundred

thousand bus. elevator has been built adjoining for that mill, making a valuable addition to that complete establishment, and without which it before had comparatively no storage.

RECAPITULATION.

Public elevator storage.....	BUSHELS. 5,280,000
Storage in mills.....	822,000
Total storage capacity.....	6,102,000

PLEASANT PARAGRAPHS.

A GEORGIA PLANTATION SONG.—The Oglethorpe *Echo* says that at a negro church in the lower part of the county, the following was sung as a hymn not long since:

June bug got de golden wing,
Lightnin' bug de flame,
Bed bug got no wing at all,
But he git dar all de same.

CHORUS—Nigger baby bow legged,
Nigger baby bow legged,
Nigger baby bow legged,
Kase he walk too soon.

HE CLEARED UP EVERYTHING.—What business were you engaged in when in the United States?" one foreign tourist asked another.

"I was a bank cashier," replied the traveler.

"Not one of those with a discrepancy, I hope," facetiously remarked the tourist.

"Oh, no. There was no discrepancy. I cleared up everything before I left. The safe remains. It is a part of the building, you know."

"BILL, does you see dat nigger coming down de hill yonder?"

Bill replied: "Indeed I does."

"Well," said the other, "dat's a mighty smart nigger, he is."

"He's been a justice of de peace."

"Must be a smart nigger," replied Bill.

"Yes; he's bin in de Legislature."

"Must be a smart nigger," chimed in Bill.

"Yes; he's been in de Congress."

"Mighty smart nigger," said Bill, who, by the way was a great church nigger.

"Why, dat nigger is de smartest man in de world."

"Oh, no," said Bill, "Jesus Christ de smartest man in de world."

"But, hold on," fairly shouted the other; "dat nigger is a young nigger yit—heep o' swell in him."

EULALIA (sentimentally)—"Oh, no! I have no desire for great wealth. I should be happy, very happy, as the wife of a noble breadwinner."

George (practically): "And I should be happy, very happy as the husband of a good bread-maker."

"She concluded to learn.—*Call*.

SELLING GOODS BY SAMPLE.—Mr. Joseph Mulhatten ex-Presidential candidate, is a Louisville hardware drummer. Recently he was engaged in selling a bill of goods to an old Dutchman in the South.

"You charge seven dollar and a half a dozen for dot knife?" asked the Dutchman in some surprise.

"Yes, \$7.50 a dozen. Razor steel, crocus ground, brass lined, stag handle, Sheffield make, —"

"But a Zinzinnati drummer, only last week offered me dot same goods already for six dollars."

"See here, my friend," said Mr. Mulhatten, "you sell your goods at just double what they cost, don't you?"

"Ya, if I buys a thing for one dollar, I sell him for two dollar; dot's shust one percent."

"Yes. Well, that Cincinnati drummer charges you \$6 for these goods, and you sell them at \$12, and make a profit of \$6. I offer them at \$7.50, and you get \$15, or a profit of \$7.50. Just a dollar and a half more, isn't it?"

"Vell, yes," said the old Dutchman, scratching his head. I guess maybe dot was so."

"All right. You just take my advice, then, and never buy anything of a Cincinnati drummer if you don't want to get swindled."

And yet Mulhatten was hopelessly defeated!

TOO HONEST TO LIVE.—An iceman and a milkman drove up to the door at the same time.

"How many pounds of ice do you leave here every morning?" asked the milkman.

"My contract calls for ten pounds, but I leave twenty for good measure. How many quarts of milk do you leave?"

"I don't leave any. They think they are getting two quarts of milk every day, but it's all pure cream."

Just then a large truck came bowling down the street. It ran over and instantly killed both the iceman and the milkman. Their last words were:

"We'll see each other in heaven."

IN A HOPELESS MINORITY.—Several years ago a prominent physician of this county was called to the bedside of a gentleman in Jackson county, sick with fever. A revival meeting was in progress in the neighborhood of the sick man, and the doctor concluded he would attend after administering the physic. He was late on his arrival at the church and had to take a front seat. The preacher preached

a rattling good sermon and had the people considerably wrought up. As he closed he stated that he wanted every person in that house who wanted to go to heaven to rise. All stood up except the doctor. "All have risen but one man," said the man of God. "I will put the reverse of the proposition. All who want to go to hell will please rise." The doctor arose, looked around, and as he saw no one standing except himself and the minister, he exclaimed: "Be Gad! parson, we are in a hopeless minority." This convulsed the whole house, and virtually broke up the revival, as none ever went to the mourners' seat afterwards.—*Macon (Ga.) Telegraph*.

A BEWILDERED LORD.—During the journey north, Lord Salisbury, the conservative leader in the House of Lords, changed his costume for a full Highland rig-out, intending it as a delicate compliment to the land of the kilt. But when he looked at himself in the glass he found that the tailor had cut his petticoats, or whatever they are called, too short. So he made up his mind to put on evening dress. He changed his upper garments and then sat down for a few moments to read up his speech. This sent him to sleep. He only woke with a start to find himself running into the station. Forgetting what had happened he thrust on his hat and appeared at the window bowing, and this was how he was dressed: He had full Highland costume as far as his waist, above was a white shirt and swallow-tailed coat, and the entire edifice was crowned by a chimney-pot hat, upon which he had sat down without noticing it. His lordship's horror when he stepped on the platform and felt the keen wind cutting his bare legs changed into absolute a only when his valet appeared scrambling out of the carriage with a pair of trousers in his hands, waving them wildly and exclaiming: "My lord you've forgotten these!"—*Referee*.

EXPECTORATION EXPECTED.—Pat. was a fresh arrival, and had obtained a situation in a hotel as a sort of man of all work.

"Now, Pat.," said the landlord, "you see that sign, 'Gentlemen must use the spittoons.' If you notice any guests violating that rule, I want you to report the matter to me."

"Oi wull, sor."

Pat. kept a sharp eye out, and after watching a gentleman for half an hour, he went to him and said:

"Dy're moind the sign forinst the wall, sor?"

"Yes."

"Phy don't ye obsarve it, thin?"

"I am not spitting on the carpet," said the gentleman, rather astonished.

"I know yer not, and yer not usin' the spit-tune nather. Spet, ye thafe, or oi'll report yez."—*Ararat Eagle*.

TIED TOO SOON.—There is a boy in St. Paul that should be killed. Last Sunday evening he crawled under the sofa, and when his big sister and her best young man were sitting as close together as possible, rigged a slip-knot around their feet. When the old gentleman came into the parlor to look for his cigar-stub they thought they would occupy separate pews. The young man fell over the centre-table, and Mary Ann sat down upon the floor with a 200 to the square inch concussion that dislocated her adjustable bangs. The old gent. thought Adolphus was drunk, and hit him with his cane sixteen times before he could tie himself loose and fall out of the window. The match is declared off.

AN EXTRAVAGANT YOUTH.—Thirty thousand dollars a year would be considered a fairly liberal allowance, even by the most exigent of school-boys. But the guardian of the Marquis of Camden, aged 12, thinks the amount insufficient, and wants it raised to \$40,000. The judge of probate before whom the application came refused to grant it. He intimated that as the total income of the youthful marquis did not exceed \$50,000 a year it would be better at present for him to get along by exercising strict economy with the \$30,000, adding that hope might be cherished of an increase of the allowance when his lordship should be sent to Eton or to a university.

A FARMER was sawing wood, when it occurred to him that he ought to have the help of one or more of his five boys. Lifting up his voice he called, but not a boy appeared. At dinner, of course, all appeared, and it was not necessary to call them.

"Where were you all about two hours ago when I wanted you and shouted for you?"

"I was in the shop settin' the saw," said one.

"And I was in the barn settin' a hen," said the second.

"I was in gran'ma's room settin' the clock," said the third.

"I was in the garret settin' the trap," said the fourth.

"You are a remarkable set," remarked the farmer. "And where were you?" he continued, turning to the youngest.

"I was on the doorstep settin' still."

Providence News.

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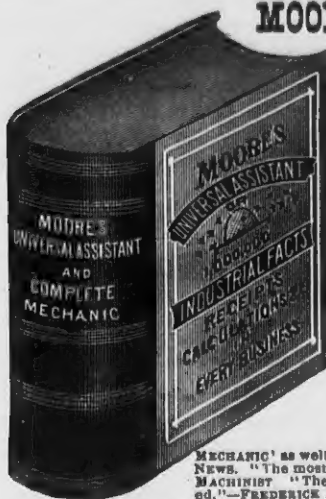
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THE GRAIN AND MILLING TRADE.

Present Condition and Prospects for the Future.

What the Leading Firms have to say on the Subject.

Desiring to give our readers some idea of the present state of the milling and grain business and the outlook for the future, we addressed the following letter to millers, grain-dealers, mill builders and mill furnishers in all sections of the country:

OFFICE OF THE UNITED STATES MILLER,
MILWAUKEE, Wis., Dec. 8, 1884.

Gentlemen—Will you kindly write us, stating the present condition of the grain and milling business in your state and the prospects for the year. Is grain coming freely to the market? What is considered a fair price for milling wheat now? Are wages less now than in January 1884? Have many new mills been built or old mills remodeled during the past year and what are the prospects in that line for the year 1885? Any other information of value to the trade will be gratefully received and published. Trusting that you will oblige our readers and ourselves by an early and full reply, we are

Yours truly,
UNITED STATES MILLER.

To this we have received the replies published below, a careful perusal and consideration of which will certainly repay our readers.

[From C. A. Pillsbury & Co., Minneapolis, Minn.]

MINNEAPOLIS, Minn., Dec. 10, 1884.
United States Miller, Milwaukee, Wis.:

Gentlemen:—Yours of the 8th received. The flour business is not very good. Prices are very low and declining at present, though the opinion is that bottom has been reached. Wheat is coming in very freely. Wages are about the same as in January 1884. No new mills have been built here during the past year and none have been remodeled.

Yours truly,
CHAS. A. PILLSBURY & CO.

[From the Pray Manufacturing Co.]

MINNEAPOLIS, Minn., Dec. 11, 1884.
United States Miller, Milwaukee, Wis.:

Gentlemen:—Yours of the 8th received, and in answer will say our mills are running full time and producing more flour than ever before, although they are said to be manufacturing on small margins. The farmers are selling wheat very freely, at least 60 per cent. of the crop is now marketed. Wheat is now selling at 70 cents, and this seems to be the ruling price at present. Wages are 10 per cent. lower than a year ago. There have been quite a number of small country mills built this season and prospects for 1885 are about the same as they were for 1884. No large mills in prospect. We are of the opinion that 1885 will see business a trifle better than it has been for the past two years. We do not anticipate any booming for at least eighteen months, but think that trade will gradually improve.

Yours truly,
PRAY MFG. CO.,

O. P. BRIGGS, Sec'y.

[From Ferdinand Schumacher.]

AKRON, Ohio, Dec. 10, 1884.
Editor United States Miller, Milwaukee, Wis.:

Dear Sir—Milling has been very brisk up to this time and promises to continue as well as usual. Wheat is not sold very freely. Ohio crop is of superior quality, weighing 62 pounds, and sells at our mills at 80 cents per bushel. Common labor is plenty at \$1.25 per day. The Seiberling Milling Co. started an 800 bbl. flouring mill in the spring, and the Akron Milling Co. is about to complete an extensive mill for flouring, oatmeal and cornmeal. Do not know of any new mills to be built this year. The growing crop looks splendid. Think there is full as much sown as last year.

Yours truly,
FERD. SCHUMACHER.

[From the Shelby Milling Co.]

SHELBY, Ohio, Dec. 11, 1884.
Editor United States Miller:

Grain is not coming in very freely. Milling wheat is worth 75 cents per bushel now. Wages less than in January 1884. No new mills built and do not hear of anyone contemplating building in this vicinity in 1885. Think prospects fair for next year for millers doing close and first-class work. Margins will probably be close, but "the fittest will survive."

[From F. N. Quale, Prop. of Central Elevator and Armada Mills.]

TOLEDO, Ohio, Dec. 10, 1884.
Editor United States Miller:

Yours of the 8th before me, and in answer to your inquiries would say: In my opinion, the grain is all right, but there is too much mill machinery to supply the wants of trade. Plenty of grain coming forward; price 74 cents for soft, hard worth 67 cents. Not much difference in wages, but lower, if anything. One mill has been remodeled. Prospects not flattering.

Truly yours,
F. N. QUALE.

[From The Stilwell & Bierce Manufacturing Co.]

DAYTON, Ohio, Dec. 10, 1884.
Editor United States Miller, Milwaukee, Wis.:

Gentlemen:—In accordance with your request, we give you the following items. We do not keep ourselves posted as to the price of wheat, but it seems to be coming into our market very freely. In regard to wages, we are paying the same we did a year ago. Very few new mills have been built in this section, but we have been kept busy changing over old mills to the roller system. Since the election, business has been very dull, and there seems to be a disposition to wait and see what the policy of the incoming administration is to be. If that administration is conservative in its policy, we think the indications are favorable for a fair degree of business in 1885. It may also be interesting to know that the "Odell" rolls have come to

the front and are daily growing in favor. We do not advertise our sales, as is the custom of other houses in our line, but we believe it to be a fact we have done more business during the past year than any other house in our line.

Yours truly,
STILWELL & BIERCE MFG. CO.

[From M. G. & N. Sage, Elkhart, Ind.]

Growing crop excellent. Small profits in milling. Grain selling moderately free, price, 70 cents. Wages, same. No new mills built, but many remodeled during past year. All will be remodeled another year that can raise the stamps, but few remaining to remodel.

M. G. & N. SAGE.

[From the Melrose Milling Co.]

EVANSVILLE, Ind., Dec. 10, 1884.
United States Miller, Milwaukee, Wis.:

In answer to yours of 8th, would say that the grain and milling business in this section is in a languishing condition, and we can see nothing encouraging for the future. The mills in this city are running about half-time, and paying 70 cents for No. 2 winter wheat. Wages about the same as in January '84. But one new mill built this year, that of Messrs. Brose & Arnold. Do not know of anybody contemplating remodeling their mills.

Yours truly,
MELROSE MILLING CO.
L. T. I.

MADISON, Ind., Dec. 10, 1884.

United States Miller, Milwaukee, Wis.:

Gentlemen:—Replying to yours of 8th inst: The grain and milling business in our State is very dull and the outlook anything but bright. Very little wheat offering in our section, but prices in buyers' favor. Millers all complaining of no margin on flour; 73 cents fair price for milling wheat. Wages about 10 per cent. lower than January '84. Two mills in our section have been remodeled and adopted full roller system. We are only running half-time to supply regular trade.

Truly yours,

W. TROW & CO.

[From F. S. Johnson & Co., Prop. of Quenchauqua Mills.]

MILFORD, Neb., Dec. 10, 1884.
The United States Miller, Milwaukee, Wis.:

Gentlemen:—Referring to your letter of 8th inst., concerning present condition and future prospects of the grain and milling business of this section:

Trade in both lines is now depressed. The extremely low prices for both wheat and corn now ruling have had a tendency to check deliveries. Most producers now seem to consider the chances for a material increase in price as poor, and as a result are beginning to market their grain more freely. We are now paying 49 and 50 cents per bushel for good milling wheat. Shippers pay from two to three cents less.

Wages remain about the same as in January, 1884, but we look for a reduction. Two new mills have been built in this section during the past year, or more correctly, one built and one remodeled.

Of course, we can make a "guess in the dark" at the prospects for next year. Our opinion is that we shall have a chance to make a showing of American "grit" for a short time, and that the clouds will gradually clear away. We look for good, active trade during the spring and summer of 1885. We remain,

Very truly yours,
F. S. JOHNSON & CO.

[From the Topeka Mill & Elevator Company.]

TOPEKA, Kas., Dec. 10, 1884.
United States Miller, Milwaukee, Wis.:

In answer to your letter of the 8th, as to the condition of trade, crops and future prospects in this section: To obey the order of Mr. Cleveland to "tell the truth," we will be compelled to say that the milling trade is dull; orders are light, and there is a general demand for lower prices. We believe that a better trade and better prices will come with the spring time; wheat is in light demand and large offering. The average price in the State for good No. 2 milling wheat is about 50 cents. The mills are paying the same wages they did in January '84. The wages have been materially reduced for all other kinds of labor. During the year there have been built a number of new mills, some of them of large capacity, and many of the old mills have been remodeled and capacity increased. With the new mills and the changes made in the old ones the milling capacity of the State has been nearly doubled. Unless there is a very material change for the better in the trade there will not be many new mills built during the year of 1885.

Winter wheat never looked better at this time of the year than it does now. There is some talk among the farmers about bugs. How much the wheat will be damaged by them cannot now be estimated.

Truly yours,
P. G. NOEL.

[From W. C. Smith, Prop. Broadway Mills.]

LOUISVILLE, Ky., Dec. 10, 1884.

Milling has been fair till now, somewhat dull, sharp work on close margin balance of year. Grain offered freely for weeks. Pay 75 cents per bushel for red. Wages unchanged. Several new mills built, and many old ones altered. Don't know about '85.

Respectfully yours,
W. C. SMITH.

[From the Fox River Flour and Paper Co.]

APPLETON, Wis., Dec. 11, 1884.
United States Miller, Milwaukee, Wis.:

Gentlemen:—In reply to yours of the 8th, would say: The milling business is poor; can't see any prospects for it being better. Grain is coming in very freely; price paid, 63 to 70 cents. We are paying same wages as have been paid during the year, but a very few new mills have been built in our section; none rebuilt. See nothing to encourage the milling industries in our section. We have been the only firm that I know of that have kept their mills running on full time. Are all speculating in our own minds what course the new administration will take. What is your opinion?

Yours truly,
S. K. WAMBOLD,
Gen. Manager and Treas.

[From Colton Bros.]

BELLEFONTAINE, Ohio, Dec. 11, 1884.

United States Miller, Milwaukee, Wis.:

Gentlemen:—In reply to your inquiries of 8th: The milling business is called dull in this part of the State; individually, we are running to full capacity 24 hours per day. Wheat is being bought at 70 to 72 cents per bushel, and is of excellent quality. Farmers are slow to sell at the price, but many are compelled to market their grain. Wages are about same as a year ago, in our business, but many manufacturing establishments have reduced wages. One new mill has been built in the county the past summer, 75 bbls. capacity, not yet running, at East Liberty. No other mills being built or changed, but plenty of old ones for sale at 25 to 50 cents on the dollar. Growing wheat looking excellent and full average crop sown.

Yours, Etc.,
COLTON BROS.

[From Victor Mills.]

SHELBYVILLE, Tenn., Dec. 10, 1884.

United States Miller, Milwaukee, Wis.:

Yours of the 8th to hand: Grain and Milling business dull; orders few. Plenty of grain on market; 70 cents outside price for strictly fancy wheat from dealers, 65 cents from farmers. Paying same wages as in January 1884. No building of mills, and little remodeling, this year, and prospects slim for next on account of unsatisfactory business this year.

Yours respectfully,
VICTOR MILLS.

[From Eagle Mill Co.]

PARKERSBURG, W. Va., Dec. 11, 1884.

Gentlemen:—The prospects for milling in this section of the country are very good. The wheat crop was better this year than for ten years before. The corn crop was almost an entire failure. Have to depend on the West for corn. Mills are paying from 75 to 80 cents per bushel for wheat and getting about all they want. There are two new mills being now erected near here, one at St. Mary's, W. Va., and one at Bellville, W. Va. None of the mills have made any changes, except us; we have taken out Buhrs and put in the Odell rolls.

Yours truly,
EAGLE MILL CO.

[From J. P. Felt, Esq.]

EMPORIUM, Pa., Dec. 10, 1884.

This is a lumbering district. No grain of any consequence raised here. No merchant mill, except mine, in a distance of 200 miles east and west and 60 miles north.

Yours, Etc.,
J. C. FELT.

[From Jas. K. Hurin, Esq.]

CINCINNATI, Dec. 11, 1884.

Editors United States Miller, Milwaukee, Wis.:

Dear Sirs:—Yours of the 8th inst. was duly received, and I reply to your interrogatories in the order in which you made them:

Wheat is not moving freely here at present. Good No. 2 is bringing about 74 cents per bushel.

Millers' wages are about the same as a year ago. Men out of work all willing to take places of those in employment and accept smaller wages than they would have been willing to take a year ago. But few mills have been built in this vicinity within this year, and those have been of small capacity.

Some few Mills have been changed over to the roller system. Not so much wheat sown this fall as a year ago. Growing crop looks well.

Yours very truly,
JAMES K. HURIN.
J. H. H.

[From Joseph & Anderson.]

MONTGOMERY, Ala., Dec. 12, 1884.

United States Miller, Milwaukee, Wis.:

Gentlemen:—In reply to yours of 8th: The grain business in our section is very light, and we expect it to continue so for the next six months. Corn and oat crop was very good last season and farmers, with few exceptions, have very near enough grain to run them through. Our crop of corn and oats is only for home consumption, no surplus to ship off. There is no wheat raised in this section. Mills buy their supply from Tennessee, Kentucky and further west. No. 2 winter (St. Louis classification) costs about 85 cents delivered here from Kentucky and Indiana. We have no knowledge of reduction in wages of labor, except our own business. We have reduced 15 per cent. We don't think there is any other flour mill of over 75 bbls. capacity in the State. There is no other mill in 60 miles of us. We believe this year, as all millers will tell you, has been the hardest we have known for many years. We attribute it to over production and the light export demand. The great trouble is, there are too many mills in this country when there is no exportation of flour. The milling capacity is too great for home wants. Large mills that never before entered this territory are now drumming every "cross-road grocery," saying there export trade has fallen off so much that they are compelled to find new territory, and for the past two months it would take a magnifying glass to see any profit in the business.

Respectfully,
JOSEPH & ANDERSON.

[From the Eufaula Mills.]

EUFULA MILLS, Ala., Dec. 12, 1884.

United States Miller, Milwaukee, Wis.:

Gentlemen:—Yours of the 8th inst. at hand. We have not been in the market since August 21, of this year, our mill having been burned on that day, and we do not know that we could throw much light on the subject.

From figures we have lately seen there does not seem to be much besides "glory" in the business, but with the new administration there is a general belief that this country will be in better condition for all trades. Wages are everywhere good in this State, and they are exceptional cases where labor has suffered by reduction, on account of the falling values of productions.

Yours respectfully,
EUFULA MILLS.

B. E. L. MARTIN, Sec'y.

[From Howell & Sons.]

MORRISVILLE, Pa., Dec. 12, 1884.

Dear Sir:—The present condition of the grain and milling business, both in New Jersey and Pennsylvania, is not satisfactory. Good milling wheat is only worth 85 cents, but even at this low price, there is scarcely any margin in flour, over the cost of manufacturing. Business men are hoping for a revival after the close of the present year, but we see very little grounds for encouragement for the near future. Manufacturing of all kinds is very dull, a great many men unemployed. We are running both our mills night and day, but at scarcely any profit. Most mills are running daytime only, and some few have shut down entirely. We know of but one mill built the past year, but quite a large number of old mills have been remodeled to the roller system. We do not think there will be much better improvement the coming year. There has been no change of wages from the past year, and while some disposition exists for lower wages for the coming year, yet do not think there will be any general change. Our greatest difficulty here is an overstocked market; this is especially the case with the fair to low grades. Many mills are unquestionably running at a loss. Stock is shipping into this market to commission houses; the houses cannot sell at the limit given them, consequently stock is held a few weeks, until the miller is compelled to realize, when he orders stock closed out, then it is slaughtered; this, of course, has its influence on the whole markets, and affects the choice patents as well as other grades. We should have been much better pleased to have been able to have given you a more encouraging report, but we know you want the facts, and you have got them.

Respectfully yours,
HOWELL & SONS.

[From the Lone Star Mills.]

DENISON, Tex., Dec. 11, 1884.

United States Miller:

In reply to your inquiries of date 8, 1884: The crop prospect is most excellent, the wheat on the ground showing a good condition. Rains have been just right for the wheat plant, which is necessarily on land in cultivation, and consequently in condition to receive the best benefit from each shower. Rains have been too light and unrequited for grazing interests. We are receiving very little grain of the '84 crop, as it is, perhaps, nearly all marketed. In this climate grain should be marketed early, as elevator facilities are not sufficient to handle the grain and keep it free from taint and insects. North Texas markets have averaged nearly 70 cents perhaps, for wheat, which is proportionately higher than any market in the world. Present price is 60 to 65 cents for 58 and 60 pound wheat, fairly plump, partially cleaned, and of the Mediterranean and Red May varieties, and the very light amber, called "Walker" wheat. This price is five cents too high for milling.

Wages generally are as good as in last three years, as far as we can observe. One new mill built in this vicinity (Bonham) and a few in the State. A light bill with millfurnishers has been the rule, and but little changing will be done this year ('84 and '85). There is undoubtedly a prosperous field for the flour and milling industry in Texas in the near future. At present the prosperous mills could be told off the fingers of one hand. Texas mills, with a few bright exceptions, are poorly equipped for flat grinding and not equipped for anything else. One-half dozen full roll mills, on good to short systems, are making some headway in competition with low flour rates from Missouri, Southern Illinois and Kansas.

EDESTON.

[From the Nordyke & Marmon Company.]

INDIANAPOLIS, Ind., Dec. 11, 1884.

United States Miller, Milwaukee, Wis.:

Your letter of recent date is before us. The local grain markets are quite firm on account of light arrivals. This firmness has only been noticeable within the past ten days. We have in elevators about 100,000 bushels, being about one-half the supply at this time in '83. There are about 1,500,000 bushels more grain in sight this week than there were this time last week. No. 2 Mediterranean brings 74 cents per bushel; No. 3, 72; No. 2 red, 72. In the corn market buyers are more numerous than sellers. New white corn brings 36 cents, new yellow, 34. The present wheat crop, so far, is doing nicely, but the acreage of 1885 is much reduced, on account of the prevailing low price of wheat.

As for wages of employees, there has been no reduction so far, as we considered it preferable to reduce the force, rather than cut down wages.

We have, during the past year, built or remodeled to the roller system 216 flouring mills, the most noticeable thing being the almost entire absence of mills on the old millstone process. A man inquiring for such an outfit, unless he be on the frontier, is considered a curiosity. Many of the roller mills built by us have been large, but the above number does not include the numerous orders through millwrights and millers who have the job of remodeling themselves, we furnishing the machinery only. This year has also entered the introduction of the new eight-break system of reduction in our large mills, which makes a large increase in the amount of middlings and less proportion of break flour.

The prospects for trade in 1885 indicate a falling off in the number of mills to be built, because of the small margin of profit in present milling, and, on account of the large amount of competition for mill jobs, prices of machinery will continue close and only the large and best equipped shops can make any money on the future contracts and still keep up the high quality of the work.

Yours truly,
NORDYKE & MARMON CO.
Per E.

[From The Eisenmayer Co.]

LITTLE ROCK, Ark., Dec. 11, 1884.

United States Miller, Milwaukee, Wis.:

Gentlemen:—Replying to your inquiry of 8th: No wheat raised in this section of the state now. No mill here but ours. We are shipping all our wheat in from Kansas and

Missouri. We remodeled last summer. No other mills in this part of the state; there are few mills in northwest corner of this state, where wheat is also grown, but of which we know nothing.

Yours respectfully,
EISENMAYER CO.
[Frank D. & A. Luckenbach, Bethlehem, Pa.]
Milling business good. Grain coming in freely. Best and biggest wheat crop we ever had. Milling wheat is quoted at 85 to 90 cents per bushel. Margins rather close. Wages lower by about 10 per cent. Some new mills have been built and remodeling to roller process is going on all the time. Prospects for 1885 good.

[From the Bridgewater Flouring Mills.]
FREDRICKSBURG, Va., Dec. 11, 1884.
Editor *United States Miller*:

Your favor of the 8th inst. received and noted. Our farmers who are able to, still hold back part, if not all, their wheat. The smaller farmers have, and still are, marketing their wheat freely, not being able to hold on, and there being little prospect of better prices in the spring. Best long berry Red is quoted at 82 to 85 cents; Fultz, 78 to 81 cents, the latter variety constituting a large portion of the crop. From 25 to 33 per cent. less has been seeded down this fall on account of drought. Wages same as in January 1884. Good hands are scarce. The Bridgewater mills have been remodeled to a complete roller mill this year. No prospect of any more changes now.

Yours truly,
J. B. FICKLEN, Manager.
[From the Jewell Milling Co.]
BROOKLYN, N. Y., Dec. 15, 1884.
United States Miller, Milwaukee, Wis.:

Gentlemen:—Your letter of the 8th inst. on hand. We are too far to one side to give you much of the information you seek. Milling here is very much depressed, and we do not look for an improvement for some time yet. A fair price for No. 2 Red in this market is 82 cents in elevator, and same for canal. Stock in store and afloat, heavier than last year. Nothing is being done in mill building or remodeling, nor is there likely to be. Wages same as at this time last year.

Yours very truly,
JEWELL MILLING CO.
BRYN-MAWR, Pa., Dec. 15, 1884.
Editor *United States Miller*:

The growing wheat looks very promising and with the open fall bids fair to be a large crop. The present crop is large and of excellent quality, and flour from it is equal to the best in the country. Wheat is coming in freely and prices range 87 cents for No. 1 long berry and 78¢ for No. 2. Flour is very dull at \$3.50 to \$4.75 as to quality, the latter for choice patents. Wages are about the same for the past, but will be reduced 10 to 15 per cent. for the new year. There have been a few new mills built in this state, and many old mills remodeled and capacity increased. A number are roller or part roller mills and more have adopted the Garden City system, the latter being less than one-half the cost for changing and results perfectly satisfactory. Unless there is a decided change in the milling business very few changes will be made the coming year. Over production appears to be breaking down the markets.

[From the Golden Gate Flouring Mills.]
SAN FRANCISCO, Dec. 16, 1884.
Editor *United States Miller*:

In reply to yours of Dec. 8: 1st. The milling interest in California is not as prosperous as usual, having sustained losses for the last two years. 2d. Grain is not coming in freely, being kept back by dry weather. 3d. Choice milling wheat is worth \$1.32 per cental at San Francisco, shipping wheat \$1.27. 4th. Wages are the same as in January '84. 5th. One new mill in this city this year; do not know of any more, hereabouts, though there may be; cannot say whether anybody means to build any new ones, should not think likely after the experience of '83 and '84.

Yours truly,
HORACE DAVIS & CO.
[From the Hungarian Flouring Mills.]
DENVER, Colo., Dec. 16, 1884.
United States Miller, Milwaukee:

Gents:—Your favor of 8th received, and in reply: The present condition of the grain and milling industries in this section is but fair. The prospect for the year's business, from a pecuniary point of view, is good, and we expect to pay expenses and make a little. Wheat has come to market very freely, two-thirds being out of the farmers' hands throughout this state. Fifty-five cents per bushel, in Denver, is now considered a fair price for good milling wheat. Wages for milling help are lower than in January 1884. But one new mill built in '84, two remodeled. Prospects extremely poor for next year. Milling capacity ample.

Respectfully yours,
J. K. MULLEN & CO.
[From the Silver Star Mills.]
RENO, Nev., Dec. 15, 1884.
Editor *United States Miller*:

Your favor of the 8th inst at hand, making inquiry concerning product and price of grain, etc., etc. In answer, have to say: Prospects of a busy season of milling better than usual for this time of year. Grain comes freely to market. Good milling wheat is worth \$1.75 per cwt. Flour selling for \$5.75 per bbl. Wages lower than formerly, especially for unskilled labor. No new mills being built. The wheat crop of this state does not exceed six thousand tons all told, a large part, nearly half, is produced for chicken and hog feed. The "market" here is strictly local, as there is no outlet for any surplus if we had any. To the west is California, where wheat is worth only \$1.25. To the east is the Salt Lake country, which produces all it needs and at lower prices than here. To the north we can't go, for want of low freight rates, there being no railways in that direction, and if we did go as far north as Oregon we should not find a market, as grain there is only worth half what it is here. To the south we can't get out of our own state, except to a narrow strip of California lying on the east side of mountains. So you see the matter of milling

in Nevada is a matter of little importance, compared with other states. At the same time it is of considerable moment here in the *Great American Basin* in a state geographically much larger than Wisconsin, which has only about 50,000 people dependent on the rather uncertain business of mining, which interest is considered as the leading one, with cattle raising second, and farming third.

As already suggested, our situation is such that a surplus in this state could not find a profitable market on the outside, and the principal reason for this is that it costs more to make a crop here than in most other states, as the farmer here is compelled to resort to artificial irrigation in almost every instance. Unless the mining interest should revive, there is no prospect that the grain product will ever be any larger than it has been the present season. This being so, it is needless to say that mill-building is at an end.

Respectfully yours,
H. H. BECK & CO.
[From the Phoenix Mills, Arizona Territory.]
PHOENIX, A. T., Dec. 15, 1884.

The production of wheat in this Territory is very limited, not to exceed 250,000 bushels annually, and, from the very nature of the country, will never exceed that amount to a very great extent. Flour trade, at present, is very dull and likely to remain so for the next year. The price of wheat, at present, is below the cost of production; there is no fixed value to it, prices ranging now from 50 to 60 cents per bushel for No. 1. Wages about same, at present, as last year.

Yours truly,
JOHN F. T. SMITH.
[From The Case Manufacturing Co.]
COLUMBUS, Ohio, Dec. 19, 1884.
United States Miller, Milwaukee, Wis.:

Gentlemen:—Your inquiry of the 8th at hand. We are so busy in connection with our own business that we have never had time to look after the amounts of grain, or the price of the same. In relation to wages the tendency is downward. A large number of manufacturers are cutting down the time and run on six and eight hours. Wages have not generally been reduced, but there is a prospect that they will be, soon. Our trade in the milling line has been and still continues to be good. We have, during the last year, erected about 25 new mills and have reconstructed about 75. We have never during the season been up with our orders, and have sufficient orders on our books now to run us up to the first of March. Inquiries for mill machinery continue as brisk as they were during any part of the season. Our foreign shipments have greatly increased during this year. We are sending a large amount of goods now to England. We anticipate that the coming year will be equally as good, if not better, than the year past, and we are preparing for it by the erection of a large addition to our factory. We find collections now much better than they were some six or eight weeks ago, and generally a more buoyant feeling amongst the millers, and we believe there is no discouragement in the line of mill-building or in the profits in the operation of a first-class mill on the roller system. We remain,

Yours truly,
CASE MANUFACTURING CO.
By Case.

[From Bridges & White.]
CRETE, Neb., Dec. 10, 1884.
Editor *United States Miller*:

The present condition of the grain and milling business is dull, decidedly so. Farmers are selling only what they are obliged to. Milling wheat brings from 45 to 50 cents at the mills. Wages are about the same as last year. A good many new mills have been built and old ones remodeled during the past year. New mills have been built at Milford, Hampton, Holdrege, Cambridge, Oxford, York, Aurora and many others. Flour trade is dull. We are putting in three double set of chilled iron and one double set of porcelain rolls. Gray's pattern; and a great many small mills are putting in rolls.

Yours truly,
BRIDGES & WHITE.
P. S.—We are putting in the rolls in place of the Jonathan Mills machines.
B. & W.

THE DESIGN OF MODERN FLOUR MILLS.

The profitable conduct of a flour mill is governed by two primary functions: 1st, the purchase of the raw material in the cheapest market; 2d, the sale of the produce in the dearest.

The purchase of wheat in the cheapest market requires the mill to be capable of treating every wheat that may happen to appear there. When, by reason of the peculiar arrangement of the mill plant, a miller is restricted to the use of particular descriptions of wheat, such restrictions will tend to enhance their price; while by the operation of the same law of supply and demand, those wheats which he is debarred from using will tend to drop in market value and play into the hands of competitors. Moreover, a miller, by allowing himself to be so restricted may destroy the difference of level between himself and his competitors which might otherwise result from fresh capital invested in the purchase and erection of new or additional plants. To sell the produce in the dearest market the miller must be in a position, by means of the machinery and its management, to manufacture the largest quantity of the very best quality the raw material is capable of yielding. Given the best combination of the best machines for a gradual reduction plant, the mechanical problem involved in the foregoing proposition turns chiefly on the variation in the effect of a given grinding appliance on various wheats or their produce. For instance, harsh wheat products require

more intense grinding, but less dressing surface than mellow wheat. Hence a gradual reduction corn mill should be so equipped as to be capable of dealing with extreme variations of wheat.

The adaptability of the mill for the treatment of extreme variations of wheat depends on the following provisions: 1. A sufficient margin of grinding power. 2. A sufficient margin of dressing surface, so contrived as to be controllable either for contraction or expansion. 'Excess of margin, however, involves: Waste of power; waste of space; increased first cost; increased current expenditure. It is therefore necessary to devote the most searching study to the problem of accurately proportioning the plant to the work it is required to perform, with the view of fulfilling the conditions just set forth—conditions, indeed, which should be held to rule with the rigor of mathematical axioms, from which to swerve is not merely dangerous but ruinous.

Another point deserves serious consideration on the part of the miller about to venture on the installation of a gradual reduction plant. The process of gradual reduction is based on the principle of roughly breaking up the wheat into products which shall not be flour, for the purpose of sorting such products on their qualitative merits—be they accidental or organic—with the view of treating each for the production of a corresponding quality of flour. It is obvious that such a process will always yield, at the termination of certain stages, small quantities of products, which, if classed separately, would be too insignificant in quantity to merit separate treatment to occupy a separate machine. They have, therefore, to be classed with the class nearest in order of merit, and that to the detriment of the efficiency both of sorting and grinding machinery. It is obvious that the larger the output of a mill, the larger will be the quantity of each class of its products, and consequently the more numerous will be the classes, each sufficient in quantity to merit separate treatment, and hence, again, the larger the mill the more perfectly can be accomplished the classification, i. e., the gradual reduction.

Next in degree of importance are the arrangements for facilitating the management of the mill. Apart from the harassed state of mind which an unmanageable mill plant induces, a persistent difficulty in the working of machinery will inevitably provoke its neglect. It is not sufficient that machines run smoothly without interruption; they should at the same time thoroughly do their work. Yet it is the former that becomes the exclusive aim of the mill hands, when persistent difficulties recur in the manipulation of any machines. For these reasons: 1. The machines selected for the mill plant should be of such simple construction, should be so powerful and adopted in such numbers, that they will perform their work with ease, and, therefore, run smoothly and uninterruptedly, while operating efficiently, during lengthened periods. This will enable the mill hands to give undivided attention to the performance of the machines, which they should be induced most vigilantly to maintain at a correct pitch. 2. In order to facilitate the control of the vigilance of the mill hands, the plant must be symmetrically disposed, easy means must be provided for testing its performance, and an efficient system of control introduced in conformity therewith.

It may seem paradoxical to point to facts so obvious, but the rapid transformation of the whole mode of manufacture seems to have thrust them out of sight, while the hurried design and the precipitate erection of gradual reduction mills resulting therefrom have promoted a state of things which makes their neglect painfully felt. Neglect on this head develops its effect most seriously just in those seasons when the margin for profit is narrowest.

Knowing the complicated difficulties of flour milling by the process of gradual reduction under the conditions which obtain in the United Kingdom, I have until recently felt the greatest reluctance to recommend its adoption. It would have been useless to explain my reasons. What possibility of being heeded on a subject which could only appeal to practical experience non-existent in this country, except in quite isolated cases? This reason for reticence, however, holds good no longer. A great number of the leading millers have plunged into the long-dreaded change, and of these a few are beginning to feel the true effects of that change.

At first, after adopting the new process, everything appears to be *coulour de rose*. "Patents," a quality of flour on a par with the better foreign brands, is produced, such as was utterly impossible under the old regime. A few trial grists with all the new machinery, keen and in apple-pie order, show results satisfactory as to yield. Now the enterprising miller rapidly sells his "patents" at what he conceives a remunerative

figure, and remains undismayed when he finds that he has to be easy as to the prices for the secondary and third grades.

These pleasant auspices change after awhile. Neighboring millers become desirous of entering the list with "patents," start gradual reduction plants, and then, passing through the same set of experiences as their pioneer, sell away those delightful "patents" most merrily. Basing their trade on this article, they forthwith undersell the original maker of it. This pioneer of the "new process," in the meantime, does not find the profits to answer his expectations, for the stocktaking at the end of a year's trading reveals figures that do not correspond with those calculated from the initial trial grists. To retract now is too late. The public have become accustomed to the superior article, and competition is there to supply it. There seems to be no issue but to continue on the path already entered.

It is necessary to dilate on the difficulties of carrying on trade under the conditions and under the pressure of a reckless, because ignorant, inexperienced competition. There can be little doubt that under such continually increasing difficulties much greater and much minuter attention must be given to the design and construction, and most of all, to the management of flour mills. Now arises the necessity of studying each design upon its special merits, based upon a natural development of the trade the miller has already established. But such separate study of each design is fatal to the contractor's essential—uniformity; and therefore it becomes absolutely necessary to disengage the design of the mill from the hands of the mill-furnisher, whom the most powerful influence—the laws of economy—inevitably urge to organize his work for the production of uniform articles under the same set of plans, to thereby reduce first cost. The closer the competition the more powerfully will the mill-furnisher be urged in this direction.

But, it will be asked, is not such a natural development of economy the very result millers should endeavor to promote in these trying times of revolution? Economy! Yes, but not economy in the wrong place. To curtail the legitimate expenditure for the first outlay in the design and construction of the mill means the substitution of a continuous after-expense; it may mean the saving at the outset of £500, or £1,000 by having continually to pay 6d. or 1s. per quarter more for the wheat.

Are millers, then, to be thrown upon their own resources for the design of gradual reduction mills? Few millers have leisure or the technical training needed for the elaboration of the details of such work. But no mill should be designed without the miller's concurrence—his hand should take part in drafting the broad lines, and his practical experience should be brought to bear on and vigilantly observe all points which affect or are likely to be affected by local needs.

A point of no mean importance is the danger arising from overstatements by vendors of machinery. Their representations, without being necessarily given in bad faith, are usually founded on maximum results, obtained under all the most favorable conditions it was possible to secure, and therefore asserted with confidence. Now in order to guard against the tendency of adventurous trading induced by the expectation of and belief in extraordinary results, based as they are on premises rarely rigorously established, the miller requires to be told the average results which take into consideration all the contingencies arising out of the natural course of manufacture and trading. Such facts, however, are most likely to be learned from those whose professional reputation rests on the accurate knowledge of such facts, whose judgment and vision is not obscured by the strife and competition of trade.

In other departments of technical work the practice of resorting to professional advice for the design of mill plants, and the drafting of specifications in conformity with the most recent experience as a control and check on the manufacturers and vendors of special machinery, has been generally established. I venture to submit that this practice, being a rational division of labor, should be extended to flour-milling. Millers who imagine they can get their designs made for nothing by mill-furnishers, should reflect whether their experience can point to able men doing good work for nothing. Work undertaken under such a pretext is either scamped or paid for under cover of other charges, and therefore uncontrollable. I am aware that to the great majority of millers accustomed to the gorgeous pictures of the Eldorado in milling, as which gradual reduction is generally displayed to their admiring gaze, my words will find no echo, but those who have gathered experience during the last momentous years, who like to grasp a great task with the earnest painstaking which alone can secure its accomplishment, will understand me.—J. A. Arnold Bucholz, in the *Miller*, London.

NEWS.

Nearly 23,000 patents have been issued during 1884. Marquette, Mich., is said to be an excellent location for a flouring mill.

The capital stock of the Dubuque (Ia.) Oat Meal Mill Co. has been increased to \$80,000.

W. J. Robb, lately with Winona Mill Co., has accepted a position with Edw. P. Allis & Co.

Hoop's Mill at Sauk Centre, Minn., was destroyed by fire Dec. 19. Loss \$15,000; insurance \$10,000.

The Ellwood elevator at Lyncam, Ill., was destroyed by fire, Dec. 7. Loss \$20,000; insurance small.

Chas. Espenschied, the Hastings, Minn., miller, contemplates enlarging his capacity by 500 bbls. per day.

Wm. Elwell is about to build a 150-barrel roller mill at Sheboygan, Wis. It will be run by steam power.

The Washburn Mills at Minneapolis will be supplied by Jan. 1, 1885, with two 1000-horse-power Wright engines.

The Brown Mfg. Co. of Cleveland, O., manufacturers of engines, etc., have sold out to Messrs. F. & H. H. Brown.

Geo. Hysers' mill in Brown's Canon, Col., was completely destroyed by a cyclone, Dec. 3. Loss \$9,000; no insurance.

It is said that \$200,000 will be expended for water-power and milling improvements in Minneapolis during the present winter.

Sixty persons have been poisoned, many of them being in a dangerous condition, in the outlying village of Hornais, Austria, owing to the carelessness of a corn dealer in mixing rat poison with the flour.

The Illinois State Millers' Association met at Springfield, Dec. 3, with a goodly number of old members present. The treasurer's report shows the Association's financial affairs to be in a healthy condition.

BURNED—John Bidwell's mill at Chico, Cal. Loss \$40,000; insurance \$28,000. W. Patton & Co.'s mill at Atkin, Minn. Loss \$18,000 insurance \$7,000. It will be rebuilt immediately.

Sidle, Fletcher, Holmes & Co., of Minneapolis, will make an elaborate display of flour at the New Orleans Exposition. The Washburn & Crosby Co., and Pillsbury & Co. will also make exhibits.

Messrs. Willenbrink Bros.' new mill at New Richmond, O., has just been completed. Mr. S. H. Stout had entire charge of the work, and the mill started up satisfactorily. It is a 75 bbl. roller mill (Stevens) and is run by steam power.

Cargill Bro.'s water power flouring mill, at Whalan, Minn., about 45 miles west of La Crosse, on the Southern Minnesota Div., was entirely destroyed by fire Dec. 18. The mill had been completely remodeled to the roller system, with the very best machinery, and was valued at \$30,000; insurance \$15,000. Three thousand bushels of wheat and five hundred bbls. of flour were destroyed. The mill was the best in Southern Minnesota, and will, probably, be rebuilt.

The new milling establishment of the Eldred Milling Company, of Jackson, Mich., is located near, and will receive its power from the engine driving the purifier and centrifugal reel factory of the George T. Smith Middlings Purifier Co. at that place. It will be equipped with Smith purifiers and Smith centrifugals, and is designed to be a model roller mill open to those interested in the most advanced ideas of modern milling. Stevens rolls will be used, the contract for the same having been awarded to the J. T. Noye Mfg. Co., of Buffalo, N. Y.

The Case Manufacturing Co., Columbus, O., have secured the contract of L. C. Lillard & Co., Marion, Ind., for a complete line of breaks, rolls, purifiers, centrifugals, bolting chests, etc., for a full gradual reduction mill on the Case system, using 14 pairs of rolls. The Case Co. have also just received a cable order from A. B. Childs & Co., London, for three purifiers; also the contract for S. E. Dewey's mill at Waterford, Pa.; for the mill of Wm. Lumpkins, at Owensboro', Ky.; rolls for W. M. Green's mill at Charlestown, Ind.; and also for machinery for N. S. Martz's mill at Greenwood, Ind.

At a meeting of the stockholders of the Lake Superior Elevator Co., held in Duluth, December 23, it was definitely decided to build another elevator at Duluth for the business of the coming year, with a capacity of 1,500,000 bushels. It is understood the Union Improvement and Elevator Co. will also build another of 1,000,000 bushels capacity. The erection of these elevators has been rendered absolutely necessary, by the proportions which the grain trade at Duluth has assumed, and by reason of the fact that the trade is increasing so rapidly. Large transactions now take place on 'change daily, and many new members have recently joined the board of trade. Duluth, the past season, shipped very nearly if not fully, as much wheat as Chicago, and she already has in store for winter storage, 4,500,000 bushels, and will have 6,000,000 bushels in all. When the new houses are completed, her capacity will be 8,700,000 bushels.

The Case Mfg. Co., Columbus, O., have been awarded the contract for remodeling the New Era Mills of Nashville, Tenn., to the full roller system. This mill when completed will be one of the largest and most complete mills south of the Ohio River. It will contain thirty-four sets of rolls, most of which are 9x30, also thirty-nine reels and scalpels, nine purifiers, and other machinery necessary for a complete 400-barrel mill. This is the second mill built by the Case Mfg. Co. in Nashville. Mr. E. T. Noel's mill of 875 barrels capacity having been in successful operation for about two years. There was a sharp competition between the roll men to get this contract, as the city of Nashville is the most important milling center of the South. The awarding of the contract to the Case Co., together with the numbers of mills they are now building in Tennessee and Kentucky, indicates that this young but vigorous company have a strong foothold in the South, and that they are determined to hold it.

The Case Mfg. Co., Columbus, O., writes us that they are in receipt of a large box of delicious oranges, sent direct and fresh from the Florida grove owned by J. P. Felt. Mr. Felt is also the owner and successful operator of the "Emporium Mills," Emporium, Pa., which two years ago were enlarged and remodeled to the full roller system by the Case Mfg. Co. This is the second annual box received from Mr. Felt, and the Case Company says: "We must say they are the most delicious fruit we have ever seen of the kind." They then, like Silas Wegg, drop into poetry thus:

'Tis good to have a friend, Friend Felt,
Who each returning year,
Will feel to 'ards us as thou has felt,
And rich gifts send to cheer.

We have a number seven "felt,"
Now on election due,
And when we get it we have felt,
Friend Felt, we'd send to you.

For fear that "felt" we ne'er acquire,
We send you "Deal's" fine flour trier;
But towards the—"Felt" will e'er aspire.

The Case Manufacturing Co. have received the following orders during the month: From Van Horn Bro's, Linnard, Kans., for a full outfit of breaks, rolls, purifiers, scalpels, bolting chests, etc., for a complete roller mill on the Case system, —12 pairs of rolls with automatic feed will be used; from C. E. Buck, Richmond, Va., for a complete outfit of breaks, rolls, purifiers, scalpels, centrifugals, etc., for a full gradual reduction mill on the Case system; from Stanley & Bickle, Glenwood, Mo., for a full line of rolls, purifiers, centrifugals, scalpels, etc., for a gradual reduction mill on the Case system; from L. C. Lillard & Co., Marion, Ind., for a full line of breaks, rolls, purifiers, centrifugals, scalpels, bolting chests, etc., for a complete gradual reduction mill on the Case system, using 12 pairs rolls; from N. S. Maity, Greenwood, Ind., for one Little Giant break machine, one improved centrifugal reel and other machinery; from Gray & Fisher, Lawrence, Mich., for seven pairs rolls; from W. M. Green Charlestown, Ind., one pair rolls, with patent automatic feed; from the Lehman Grinding Disk Co., Kansas City, Mo., for one pair rolls, with patent automatic feed; from B. Buffat & Son, Knoxville, Tenn., for one pair rolls with patent automatic feed; from Chas. Troup, Walaska, Ill., for two pairs rolls with patent automatic feed; from Schoyenke & Emde, Sugar Grove, O., for one No. 1 single purifier; from the Great Western Mfg. Co., of Leavenworth, Kans., for eight pairs rolls with patent automatic feed, to be shipped to J. W. Stover, Fredonia, Kans.; from M. Lynn, Belden, Ind., for breaks, rolls, scalpels, etc.; from the Richmond City Mill Works, Richmond, Ind., for one pair rolls with automatic feed, to be shipped to Mt. Sterling, Ky.; from Richter & Co., Williamstown, W. Va., for one pair rolls with automatic feed; from R. Tuttle & Co., Columbus City, Ind., for one No. 1 double purifier; from Myers & Natger, Spencer, O., for four pairs rolls with patent automatic feed.

Edw. P. Allis & Co., of the Reliance Works, Milwaukee, Wis., have recently received the following orders for their celebrated Gray's noiseless belt roller mills: Geo. W. Smith, Clearfield, Pa., ten pairs Allis rolls in Gray's noiseless belt frames, and other machinery necessary to fit them out on the roller system; C. A. Gambrell & Co., Baltimore, Md., one double machine; R. M. Todd & Co., Albert Lea, Minn., one double machine; A. Pardee & Co., Mauch Chunk, Pa., one double porcelain roller mill; Northey Bros., Woonsocket, D. T., a No. 2 four-break reduction machine, double roller mill, etc.; R. W. Mehard, East Brook, Pa., five double machines and other special machinery to give them a full roller mill; Lyman & Co., St. Joseph, Mo., two double machines, etc.; G. Bechtel, Burford, Ont., two double machines, and complete outfit for their mill, including a No. 2 four break machine, etc.—Mr. Bechtel, after carefully looking into the merits of the various machines decided to place his order with Allis & Co.: Sits & Kirschner, Peterson, Ia., three double machines, etc.; J. A. Simacott, Fair Haven, Minn., four double machines; McClintock & Tyson Bros., Rossville, Kas., one double machine; Shick & Wamshor, Pt. Clinton, Pa., one double machine; Thomas Williams, Pontiac, Ill., one No. 2 four-break machine, two double roller mills, and machinery necessary to put them on the roller system; J. Markley, Minneapolis, Minn., one double machine; Cedar Falls Mill Co., Cedar Falls, Ia., one double machine; A. T. Parker, Mason City, Ia., four double machines, and other special machinery; G. W. Cunningham, Tiffin, Ohio, one double machine; A. & H. Wilcox, Jackson, Mich., one single machine; J. D. & P. Hasbrouck, High Falls, N. Y., a No. 2 four-break machine; Hill & Fry, Holdredge, Neb., a No. 2 four-break machine, two double machines, also a 10x30 Reynolds-Corliss engine complete; R. McAdoo & Co., Tiffin, Ohio, five double machines, etc.; M. J. Church, Fresno, Cal., four double machines; Milford & Wilson, Ord, Neb., four double machines, and necessary machinery for a roller mill; O. Dillin & Son, Marengo, Ia., a No. 2 four-break reduction machine, two double machines, etc.; Jos. Kratochwill, Dayton, Ohio, one double machine; R. Thomas & Co., Newman, Ill., one double machine.

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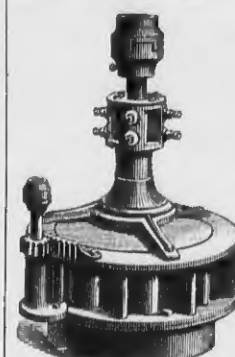
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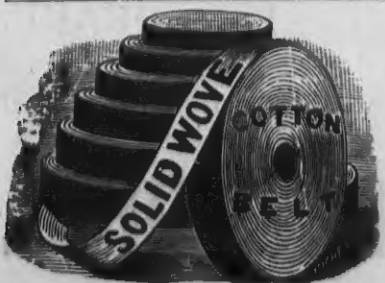
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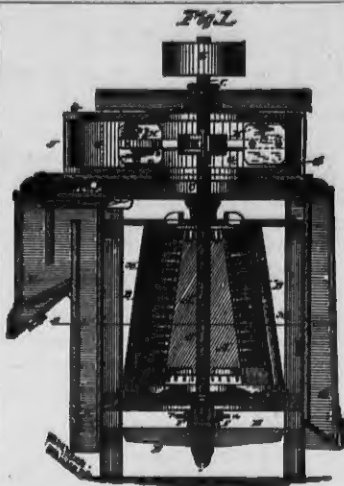
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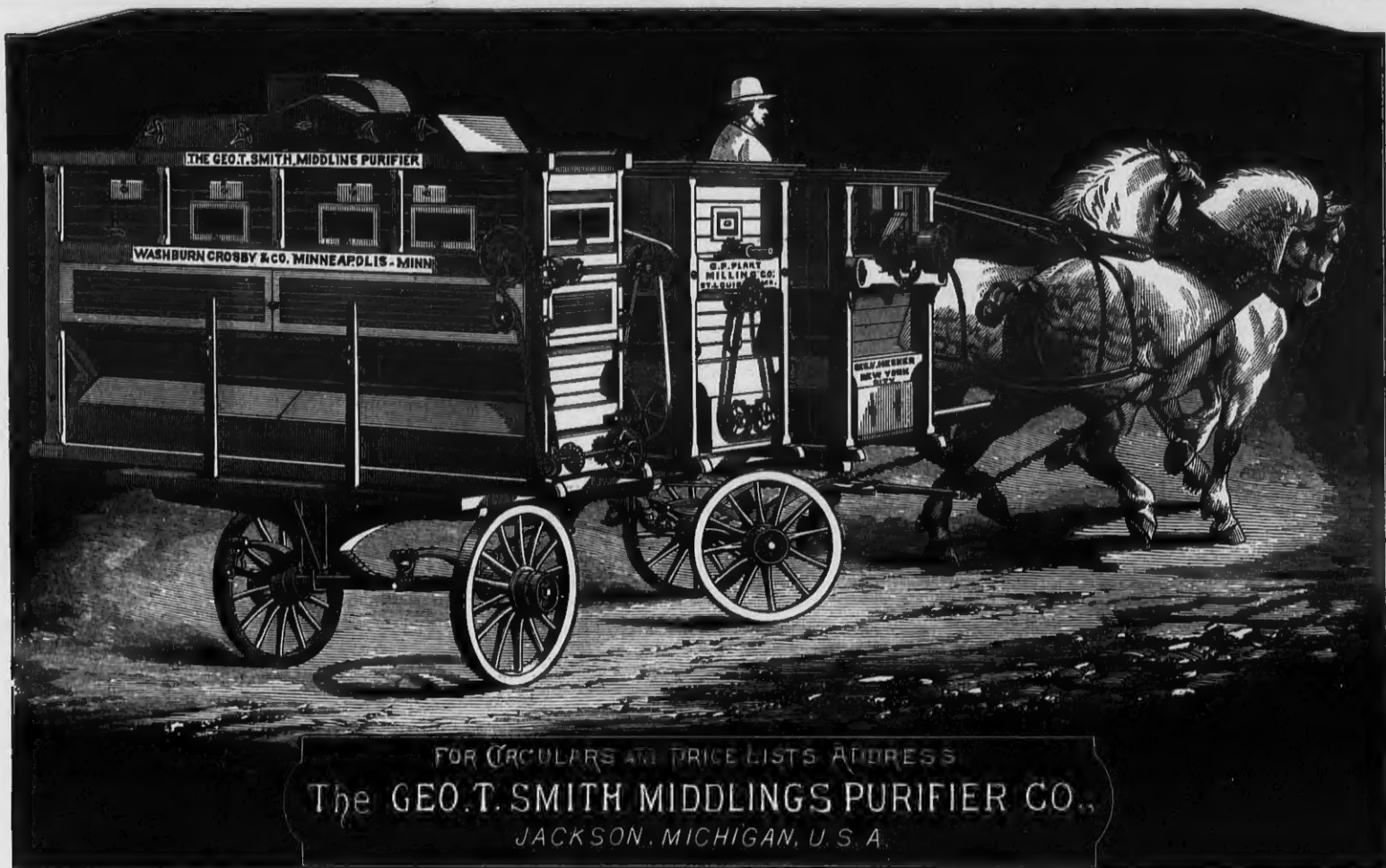
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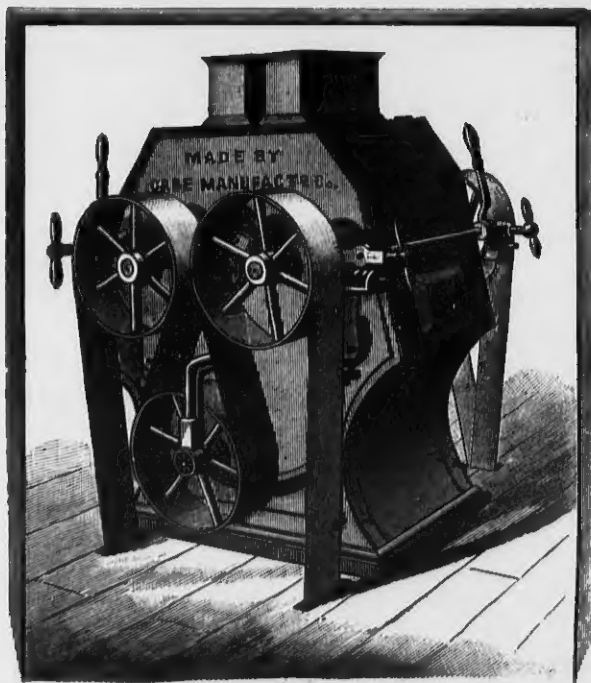
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Read the Following Letter about our Feed.**CASE MFG. CO., Columbus, O.**

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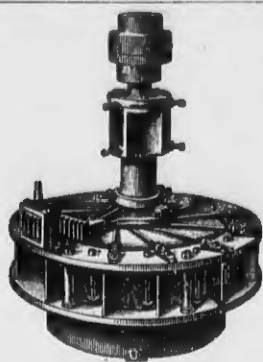
GENTLEMEN:—Your Automatic Feed which I placed on my Odell Rolls has been a bonanza to me, I have no more use for the CASE KNIFE which I kept constantly on hand to dig at the Roller Feed; I don't have any more choke up in my mill owing to the feed stopping and backing up the supply spout. The Case Feed has now been running on my Odell Mills for more than one year, during which time I have never given it one moment's attention and have never known an instance when the feed was not perfectly distributed over the entire length of the Rolls. It has added to the capacity of my mill one-fourth, has enabled me to make a cleaner finished, and a more even product, and in the aggregate has saved me more than the price of my rolls. I will add that were I buying Rolls now I would not accept them as a gift without the Case Automatic Feed. If I put in any more Rolls you can rest assured the BISMARCK will go in my mill, for since repairing my mill I have learned that the CASE BISMARCK ROLL is the superior of all others, in adjustments, feed and simplicity.

Very Truly,

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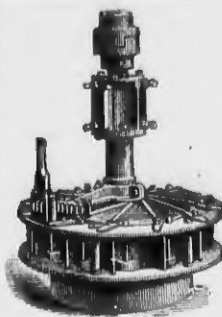
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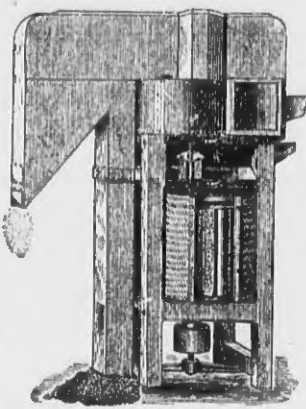
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Yours, etc.,

R. H. FAUCETT, Pres.

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Yours respectfully,

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Gentlemen:—The 125 barrel All Roller Mill you built us has been running all summer, and does its work perfectly. Before contracting with you for this machinery we visited many Roller Mills throughout the West and Northwest, built by the different leading Mill-furnishers, and from all we could see, those built by you seemed to be giving the best satisfaction, and this is why we bought our machinery of you. Our mill comes fully up to your guarantees, and the capacity runs over your guarantee. The bran and offal is practically free from flour, and our patent and bakers' flour compares favorably with any we have seen elsewhere. I don't think anyone can beat us. Your Roller Machines are the best we have seen; they run cool, and the interior does not sweat, and cause doughing of the flour. Judging from our success, we would recommend other millers to place their orders with you.

Yours truly,

J. T. FORD.

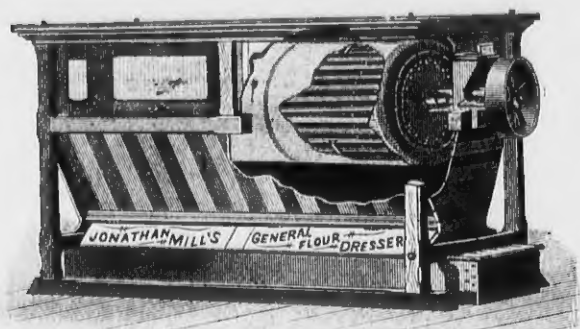
Letters on file in our office from a large number of small Roller Millers giving as favorable reports as above. A portion will be published as occasion demands.

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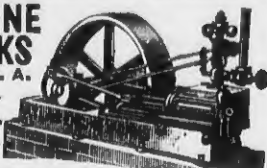
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DeLOACH WATER WHEELS.



Simplest and Cheapest Manufactured, and have received the unqualified endorsement of all who have used them. Every small Mill can afford one. Send for large illustrated Catalogue of Wheels and general Mill supplies. "The Star Grind" Millstones from our quarry are unsurpassed and sell remarkably low. A. A. DeLoach & Bro., Atlanta, Ga. U. S. A.

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 COCKLE SEPARATOR MFG. CO., Milwaukee, Wis.
 GENTLEMEN:—Your favor of the 5th at hand and noted. We bought one No. 2 machine of you, we think in 1877; it has always done its work satisfactorily and continues to do so. We have not laid out one cent for repairs. If you make all your machines to last as well as ours, you will grow poor in the business.
 Yours truly,
 W. SCHMIDT & BRO.

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The improved KURTH PATENT
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 A PERFECT & ECONOMICAL SEPARATOR
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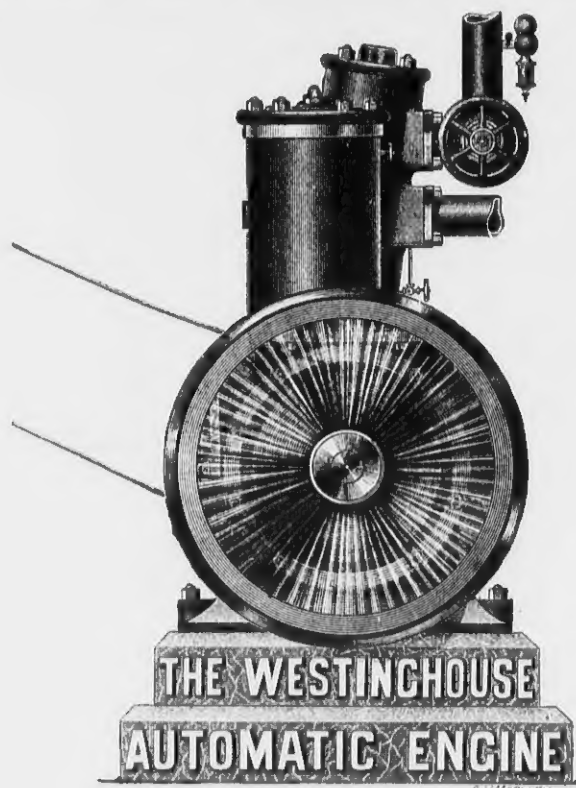
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